**White paper**
Nuance Dragon Medical Cloud Service
für Deutschland und Österreich

# Datensicherheit und Servicekontinuität

## Nuance Dragon Medical Cloud Service für Deutschland und Österreich.

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Fazit

# Nuance gewährleistet seinen Kunden im Gesundheitswesen höchste Datensicherheit und Servicekontinuität.

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Nuance Dragon Medical One ist eine cloudbasierte Spracherkennung für die medizinische Dokumentation in Krankenhausinformationssystemen (KIS), Praxisverwaltungssystemen (PVS), Pflegedokumentationsoftware und weiteren Anwendungen. Es bietet Ärzten einen konsistenten, personalisierten und sicheren Weg, ihre Patientendokumentation effizient und auf die natürlichste Weise, mit ihrer Stimme zu erfassen — jederzeit und überall.

Die PowerMic Mobile App ist eine ergänzende, cloudbasierte Lösung, die ein Smartphone in ein hochwertiges Mikrofon und Navigationstool verwandelt, um eine einwandfreie Dokumentation zu ermöglichen.

Unsere eigenen Sicherheitsmaßnahmen in Kombination mit der hochverfügbaren redundanten Infrastruktur gewährleisten Ärzten und Pflegeteams eine schnelle, genaue, sichere und unterbrechungsfreie Spracherkennung.

## Sicherheit, Konformität und Zuverlässigkeit

Die Lösungen Dragon Medical One und PowerMic Mobile werden von dem Nuance Partner Microsoft in Microsoft Azure gehostet. Microsoft Azure bietet eine Cloud-Computing-Plattform über das weltweit größte globale Multi-Terabit-Netzwerk. Der Azure-Service ist 24x7x365 hochverfügbar und garantiert eine Betriebszeit von mindestens 99,5 %.

Dragon Medical One und PowerMic Mobile werden über zwei deutsche Microsoft Rechenzentren in Berlin und Frankfurt am Main bereitgestellt. Beide Rechenzentren sind SOC 1-, SOC 2- und C5-konform.

## Erfüllung der hohen Sicherheitsstandards

Die Microsoft Azure Umgebung ist eine gemäß ISO 27001 zertifizierte Cloud-Computing-Plattform. Sie bietet mehrere Sicherheitsebenen zum Datenschutz, darunter physische Barrieren, Audit- und Protokollverwaltung, Verschlüsselung, Identitäts- und Zugriffsmanagement sowie Bedrohungsüberwachung.

Microsoft Azure gewährleistet den Schutz und die Sicherheit von Daten mit strengen Sicherheitsstandards und -verfahren. Dazu gehören Denial of Service, Erkennung von Netzwerkangriffen und regelmäßige Penetrationstests. Mithilfe eines Red-Team-Ansatzes wird die Erkennung von Sicherheitslücken kontinuierlich verbessert. Weitere Informationen zu Microsoft Azure in Deutschland sind auf folgender Seite zu finden https://azure.microsoft.com/de-de/overview/trusted-cloud/.

Microsoft Azure unterstützt Compliance-Maßnahmen in Verbindung mit zahlreichen internationalen und branchenspezifischen Anforderungen hinsichtlich der Erfassung und Nutzung personenbezogener Daten. Das sind insbesondere:

— Europäische Datenschutz-Grundverordnung (DSGVO)

— Bundesdatenschutzgesetz (neu), (BDSG (neu))– Cloud Computing Compliance Controls Catalog (C5)

— internationale Standards, insbesondere ISO 27001, ISO 27017 und ISO 27018

— Security Organisation Controls (SOC 1, SOC 2 und SOC 3)

## Sicherer Zugriff auf die Microsoft Azure Rechenzentren

- **Physischer Zugriff**: Die Mitarbeiter von Nuance haben bzw. benötigen keinen physischen Zugriff auf die Microsoft Rechenzentren. Microsoft schützt seine Azure Rechenzentren durch erweiterte sichere physische Zugriffsmethoden.
- **Zwei-Faktor-Authentifizierung/Jump Server**: Für einen elektronischen Zugriff auf die Rechenzentren müssen autorisierte Personen ihre Identität über eine Zwei-Faktor-Authentifizierung bestätigen. Darüber hinaus erfolgt der Zugang zu der Nuance Produktionsumgebung über einen zwischengeschalteten Jump Server, um unbefugte Zugriffe zu verhindern.

## Sicherheitsmaßnahmen von Nuance

Die Sicherheitsmaßnahmen von Nuance sollen zum Schutz von Kunden- und Unternehmensdaten beitragen. Das umfasst:

**Sicherheit in der Softwareentwicklung**
Nuance richtet sich nach branchenüblichen Richtlinien, wie dem Microsoft Security Development Lifecycle (Microsoft SDL) und dem Building Security in Maturity Model (BSIMM). Das Programm für einen sicheren Softwareentwicklungs-Lebenszyklus (SDLC) bietet ein sicheres Design- und Implementierungskonzept, das gewährleistet, dass Nuance Softwareanwendungen frei von Sicherheitslücken konzipiert und entwickelt werden. Gleichzeitig liefert es Entwicklern Sicherheitstests, Strukturen und Anleitungen.

Nuance nutzt den Service von Drittanbietern zum Schutz des Nuance Cloud-Services vor Viren und Malware sowie zur Durchführung regelmäßiger Penetrationstests. Außerdem werden wöchentliche interne und externe Scans zur Identifizierung potenzieller Schwachstellen durchgeführt. Alle gefundenen Schwachstellen werden mit höchster Priorität behoben.

**Verschlüsselung bei der Datenübertragung**
Die Nuance Client-Anwendungen zur Spracherkennung übertragen Audiodaten in Echtzeit zur Verarbeitung an den Dragon Medical Cloud Service. Die komplette Kommunikation zwischen den Client-Anwendungen und dem Dragon Medical Cloud Service erfolgt über HTTPS unter Verwendung von TLS 1.2 mit einem AES 256-Bit-Verschlüsselungsalgorithmus.

Audiodaten werden niemals lokal auf dem Gerät des Anwenders gespeichert. Der erkannte Text wird verschlüsselt und für die dauerhafte Speicherung direkt an die Zielanwendung zurückübertragen.

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Alle Kundendaten werden bei ihrer Speicherung (Data at Rest) verschlüsselt. Zum Speichern der Text- und Audiodaten von Kunden nutzt der Dragon Medical Cloud Service den Dienst Azure Managed Disks mit Storage Service Encryption (SSE). Metadaten der Kunden wie z. B. Lizenzinformationen, Benutzerkonten werden in SQL-Serverdatenbanken unter Verwendung der transparenten Datenverschlüsselung von Microsoft Azure gespeichert.

Beide Microsoft Azure Services wenden AES-256-Bit-Verschlüsselung an, um das höchste Sicherheitsniveau für gespeicherte Daten zu gewährleisten.

**Datenaufbewahrung und -nutzung**
Audio- und Textdaten werden zur Bereitstellung des erworbenen Dienstes genutzt. Sie dienen außerdem dazu, den Spracherkenner für individuelle Nutzerprofile zu trainieren und zu optimieren sowie die Spracherkennungsgenauigkeit für alle Nutzer zu verbessern. Dragon Medical One benötigt keine Patienten-Metadaten und verknüpfen keine spezifischen Informationen mit einzelnen Patienten.

**Hohe Verfügbarkeit und Servicekontinuität**
Dragon Medical One wird in einer Aktiv/Aktiv-Konfiguration mit kontinuierlicher Datenreplikation zwischen den zwei Microsoft Azure Rechenzentren bereitgestellt. Sollte im unwahrscheinlichen Fall ein Rechenzentrum ausfallen, wird der Betrieb auf das alternative Rechenzentrum umgeleitet, um ein Recovery Point Objective (RPO) von 15 Minuten und eine maximale Ausfallzeit (MAO) von 6 Stunden zu gewährleisten.

In jedem Rechenzentrum sind über die Systemarchitektur von Nuance Dragon Medical Cloud Service folgende Hochverfügbarkeitsoptionen erhältlich:

— komplett redundante Netzwerkinfrastruktur mit Lastenausgleichsmodulen und -Switches

— mehrere geclusterte Anwendungsserver

— hochverfügbarer Netzwerkspeicher mit Glasfaserverbindungen

— geclusterte Datenbankserver

— geclusterte Sprachserverfarm.

## Fazit

Bei Nuance gewährleisten wir durch kontinuierliche Weiterentwicklung, umfassende Sicherheitsstrategien und entsprechende Kontrollen, dass die uns anvertrauten Gesundheitsdaten vertraulich und geschützt bleiben.

Unsere Sicherheitsverfahren, kombiniert mit der hochverfügbaren und redundanten Infrastruktur, bieten Ärzten und Pflegeteams genau den schnellen, sicheren und kontinuierlichen Service, den sie erwarten und den ihre Patienten verdienen.

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HC_5025_03_WP, May 20, 2021_GER_GERMANY

# Nuance
# Dragon Medical One
# Zertifikate & Compliance

Stand 31. August 2022

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HC_5025_03_WP, May 20, 2021_GER_GERMANY

# Nuance Datenschutz-richtlinie

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## Nuance Datenschutzrichtlinie

Als weltweiter Branchenführer im Bereich der dialogorientierten KI und der Spracherkennung unterstützt Nuance Kunden aus dem öffentlichen und privaten Sektor mit Lösungen für das Gesundheitswesen. Nuance ist es wichtig, Lösungen anzubieten, die geltende Gesetze zum Schutz der Privatsphäre und des Datenschutzes einhalten.

In Anerkennung des Stellenwertes der europäischen DSGVO als globales Datenschutzmodell hat Nuance Systeme und Prozesse angepasst, um die strengen gesetzlichen Anforderungen zu erfüllen. Nuance bleibt dem Grundsatz fest verpflichtet, den Kunden bei der Einhaltung aktueller und sich ändernder Bestimmungen zum Schutz der Privatsphäre und des Datenschutzes stets zu unterstützen. Daher werden auch in Zukunft Systeme und Prozesse fortlaufend überprüft und bei Bedarf angepasst.

Die Datenschutzrichtlinien von Nuance legen für die Europäische Union/den Europäischen Wirtschaftsraum (EU/EWR) einheitliche und geeignete Datenschutzstandards innerhalb des Unternehmens fest für:

— die Verarbeitung personenbezogener Daten in der EU/im EWR

— die grenzüberschreitende Übermittlung und/oder Verarbeitung von personenbezogenen Daten außerhalb der EU/des EWR

## Grundsätze der Verarbeitung personenbezogener Daten

Nuance verpflichtet sich, die personenbezogenen Daten der Kunden und deren Kunden zu schützen.

Im Mittelpunkt der Nuance Datenschutzgrundsätze steht das Recht der Betroffenen, die Erhebung, Verwendung und Verbreitung ihrer personenbezogenen Daten zu kontrollieren. Nuance ist der Überzeugung, dass Datenschutzgrundsätze durch strenge IT- und Informationssicherheitsmaßnahmen unterstützt werden müssen. Sie sind notwendig, um die Vertraulichkeit, Integrität und Verfügbarkeit personenbezogener Daten zu gewährleisten. Jedes Produkt und jede Dienstleistung von Nuance, die personenbezogene Daten verarbeitet, ist daher:

— so gestaltet, dass die Privatsphäre gewahrt bleibt,

— so gestaltet, dass die Auswirkungen menschlichen Versagens verhindert oder minimiert werden, und

— Systemaktionen werden auf das zulässige Mindestmaß eingeschränkt.

Die wesentlichen Datenschutzprinzipien von Nuance umfassen insbesondere:

— Personenbezogene Daten werden standardmäßig in jeder Software automatisch geschützt sein.

— Die Zwecke, für die personenbezogene Daten erhoben werden, werden zum Zeitpunkt der Datenerhebung angegeben. Die anschließende Verwendung der personenbezogenen Daten wird auf die Erfüllung dieser Zwecke beschränkt.

— Unterstützung der Ausübung der grundlegenden individuellen Datenschutzrechte durch die betroffene Person oder den Kunden.

— Beschränkung der Datenerfassung und -aufbewahrung auf das Minimum an Informationen, die zur Erfüllung des beabsichtigten Datenverarbeitungszwecks erforderlich sind.

— Beschränkung des Datenzugriffs und der Datenverarbeitung auf das zur Erfüllung des Zwecks unbedingt erforderliche Maß.

— Sicherheitsvorkehrungen zum Schutz gegen Risiken, wie Verlust oder unbefugten Zugriff, Vernichtung, Verwendung, Änderung oder Weitergabe von Daten.

— Nuance trägt die Verantwortung für die Einhaltung dieser Grundsätze, einschließlich der Verantwortung für alle Unterauftragnehmer, Unterauftragsverarbeiter oder andere ähnliche nachgelagerte Anbieter von Nuance Produkten.

## Organisation

Die global ausgerichtete Datenschutzabteilung von Nuance, unter Leitung des Chief Privacy Officers, kümmert sich weltweit um den Schutz der Datenrechte von Einzelpersonen.

In Übereinstimmung mit den EU/EWR-Vorschriften hat Nuance einen Datenschutzbeauftragten (DSB) ernannt. Außerdem hat Nuance ein Büro des Europäischen Datenschutzbeauftragten mit Sitz in Dublin, Irland, eingerichtet, das die folgenden Aufgaben zur Unterstützung der Datenschutzverpflichtungen wahrnimmt:

- Beratung und Unterweisung von Nuance Mitarbeitenden über die Verpflichtungen von Nuance gemäß der DSGVO
- Überprüfung der Einhaltung der DSGVO und lokaler Vorschriften
- Beratung bei spezifischen Fragen zu Datenschutz-Folgenabschätzungen
- Einrichtung einer Kontaktstelle für die Aufsichtsbehörden

Die Nuance Abteilung für Datenschutz-Compliance führt regelmäßig intensive interne Datenschutzprüfungen durch und ist für das Management von Datenschutz-Folgenabschätzungen, das Risikomanagement von Anbietern und die Führung eines Verzeichnises aller Kategorien von im Auftrag des für diese Daten Verantwortlichen durchgeführten Tätigkeiten der Verarbeitung personenbezogener Daten verantwortlich.

## Verantwortliche und Auftragsverarbeiter

Bei der Bereitstellung der Produkte und Dienstleistungen, die personenbezogene Daten verarbeiten, handelt Nuance üblicherweise als Verarbeiter personenbezogener Daten im Auftrag des Verantwortlichen (d. h., des Auftraggebers). Wie in der Auftragsverarbeitungsvereinbarung gemäß Art. 28 (3) DSGVO dokumentiert, handelt Nuance als Auftragsverarbeiter ausschließlich auf Weisung des Auftraggebers.

## Unterweisung der Mitarbeitenden

Der Datenschutz ist nicht nur das Anliegen des Nuance Datenschutzteams. Weltweit sind alle Mitarbeitenden von Nuance, unabhängig von ihrem Standort, verpflichtet, eine jährliche Schulung zum Thema Datenschutz zu absolvieren, einschließlich einer speziellen Schulung zur DSGVO.

## Bewertung der Auswirkungen auf den Datenschutz

Bei jeder neuen Form der Verarbeitung personenbezogener Daten oder bei wesentlichen Änderungen der Art der Verarbeitung personenbezogener Daten führt Nuance eine Bewertung der Auswirkungen auf den Datenschutz durch, um festzustellen, ob die neue oder geänderte Verarbeitung Risiken für den Datenschutz birgt. Für alle festgestellten Risiken wird ein Handlungskonzept erstellt, das darauf abzielt, die Risiken der Verarbeitung zu verringern oder zu beseitigen.

## Datenschutz-Folgenabschätzungen

Obwohl Datenschutz-Folgenabschätzungen in erster Linie in der Verantwortung des für die Datenverarbeitung Verantwortlichen liegen, verfügt Nuance über ein vollständig dokumentiertes Verfahren zur Bestimmung der Notwendigkeit einer eigenen Datenschutz-Folgenabschätzung, wenn besonders hohe Risiken festgestellt werden.

Bleibt das Risiko für die Rechte und Freiheiten der betroffenen Personen auch nach der Durchführung der Datenschutz-Folgenabschätzung und der Anwendung geeigneter Maßnahmen zur Risikominderung hoch, wenden sich der Chief Privacy Officer und der Datenschutzbeauftragte zur Beratung an die zuständige Datenschutzaufsichtsbehörde.

Nuance unterstützt die Kunden bei der Durchführung von Datenschutz-Folgenabschätzungen durch die Bereitstellung relevanter Informationen über die Verarbeitung personenbezogener Daten.

## Rechte der betroffenen Person

Vorbehaltlich etwaiger Einschränkungen durch EU- oder nationales Recht, unterstützt Nuance die Kunden bei Anfragen von betroffenen Personen in Bezug auf deren Rechte gemäß der DSGVO, einschließlich:

- Informationen zur Verarbeitung von Daten
- Zugriff auf personenbezogene Daten
- Berichtigung von personenbezogenen Daten
- Löschung von personenbezogenen Daten
- Einschränkung der Verarbeitung von Daten
- Persönliches Widerspruchsrecht zur Datenverarbeitung
- Verzicht auf automatisierte Entscheidungsfindung und Profiling
- Übertragbarkeit personenbezogener Daten

Es ist eher unwahrscheinlich, dass sich eine Person direkt an Nuance als Auftragsverarbeiter wendet, um die Wahrnehmung ihres Rechts auf Schutz ihrer personenbezogenen Daten zu verlangen. Sollte dieser Fall denoch eintreten würde Nuance den Antragsteller anweisen, seinen Antrag zunächst an den für die Verarbeitung Verantwortlichen zu richten und den für die Verarbeitung Verantwortlichen über diesen Antrag informieren.

## Aufbewahrung und Löschung von Daten

Im Einklang mit der Verpflichtung von Nuance zum Grundsatz der Datenminimierung speichert Nuance Daten nur so lange, wie es für die Erfüllung der in den Vereinbarungen mit den Kunden, genannten Zwecke erforderlich ist. Die Dauer der Verarbeitung richtet sich nach den jeweiligen Vereinbarungen und etwaigen gesetzlich vorgeschriebenen Aufbewahrungsfristen und stehen im Einklang mit den Richtlinien von Nuance. In den meisten Fällen beträgt dieser Zeitraum drei Jahre. Der Zeitraum hängt aber im Einzelfall von der Art der Daten, der Verarbeitungstätigkeit oder den jeweils aktuellen gesetzlichen Anforderungen ab. Die Einhaltung der Aufbewahrungsfristen wird vom Nuance Datenschutz-Compliance-Team überprüft.

Auf schriftlichen Antrag des Kunden oder so schnell wie möglich nach Beendigung der Kundenbeziehung und der damit verbundenen Vereinbarungen wird Nuance alle personenbezogenen Daten löschen, es sei denn, Nuance ist nach geltendem Recht verpflichtet, die personenbezogenen Daten weiterhin zu speichern.

## Verzeichnis von Verarbeitungstätigkeiten

Nuance verpflichtet sich zum vertrauensvollen Umgang und der sorgsamen Verwahrung der anvertrauten personenbezogenen Daten im Auftrag des Verantwortlichen. In Erfüllung der regulatorischen Anforderungen führt Nuance vollständige Aufzeichnungen über die Verarbeitungstätigkeit für alle seine gehosteten Cloud-Produkte und -Dienste.

## Management von Datenschutzvorfällen

Nuance hat eine Richtlinie für das Management von Vorfällen und benachrichtigt die Kunden über jeden Vorfall, der zur versehentlichen oder unrechtmäßigen Vernichtung, zum Verlust, zur Änderung, zur unbefugten Weitergabe oder zum Zugriff auf personenbezogene Daten im Rahmen der Zuständigkeit eines Mitarbeitenden, Unterauftragsverarbeiter oder eines anderen Dritten führt.

Für den Fall einer Verletzung des Schutzes personenbezogener Daten hat Nuance Prozesse für die Identifizierung, Abschwächung und Behebung der Verletzung eingerichtet, soweit die Behebung der Verletzung im Einflussbereich von Nuance liegt.

Nuance führt ausführliche Aufzeichnungen über Datenschutzvorfälle, die von einer Aufsichtsbehörde überprüft werden können.

## Unterauftragsverarbeiter

Nuance bedient sich bei der Bereitstellung der Produkte der Unterstützung durch andere Organisationen - zum Beispiel beim Hosting von Diensten oder bei der Bereitstellung von Cloud-basierten Tools für den Support. Alle diese Unterauftragsverarbeiter sind in den Auftragsverarbeitungsvereinbarungen für jedes Produkt und jede Dienstleistung aufgeführt.

Nuance gestattet diesen Organisationen nicht, personenbezogene Daten ohne einen Auftragsverarbeitungsvertrag zu verarbeiten, der den Unterauftragsverarbeiter denselben Datenschutzverpflichtungen unterwirft, die Nuance mit den Kunden vereinbart hat.

Alle Organisationen, die von Nuance mit der Verarbeitung personenbezogener Daten beauftragt werden, unterliegen einer Risikobewertung des Anbieters in Bezug auf Sicherheit und Datenschutzpraktiken.

## Verarbeitung von Gesundheitsdaten ausschließlich innerhalb der EU/des EWR

Personenbezogene Daten der besonderen Kategorie nämlich Gesundheitsdaten, die in Audio- und Textdateien enthalten sind, werden nur von Nuance-Einrichtungen in der Europäischen Union verarbeitet.

## Verarbeitung außerhalb der EU/des EWR

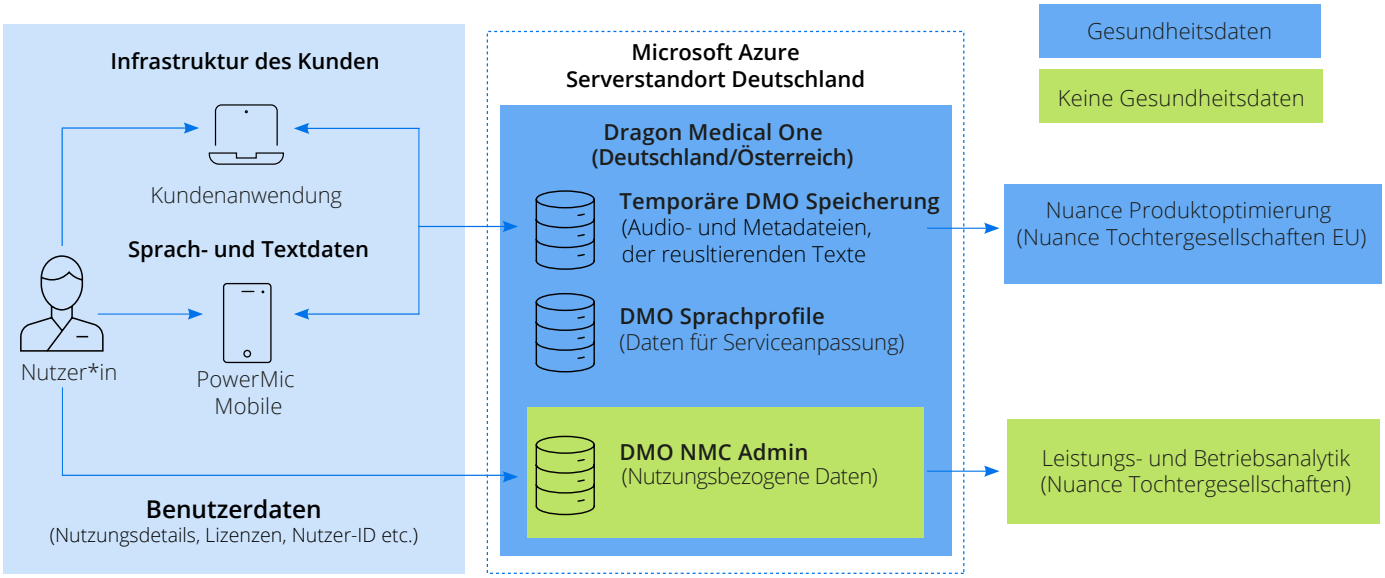
Während personenbezogene Daten der besonderen Kategorie, die in Audio- und Textdateien enthalten sind, ausschließlich in der Europäischen Union verarbeitet werden, kann es (z. B. bei dem Support außerhalb der Geschäftszeiten) vorkommen, dass einige personenbezogene Daten, wie z. B. die Daten der Person, die den Support anfordert (sofern keine anderweitigen Anweisungen des Verantwortlichen vorliegen), aus anderen Ländern abgerufen oder in andere Länder übertragen werden. Diese Datenübertragungen sind begrenzt, verschlüsselt und sicher.

In Übereinstimmung mit der DSGVO und im Einklang mit den Vorgaben der Europäischen Kommission zu internationalen Datentransfers stellt Nuance sicher, dass gültige rechtliche Mechanismen und damit verbundene Schutzmaßnahmen für den Export von Daten an Nuance Tochtergesellschaften und Unterauftragsverarbeiter außerhalb der EU/des EWR bestehen.

Neben den Angemessenheitsbeschlüssen der EU für bestimmte Länder - z. B. das Vereinigte Königreich oder Kanada - verwendet Nuance in den Vereinbarungen mit externen Tochtergesellschaften und Unterauftragsverarbeitern Standardvertragsklauseln (SCC SVK) der Europäischen Kommission, um den Schutz der verarbeiteten personenbezogenen Daten zu gewährleisten.

Ab dem 27. September 2021 verwendet Nuance die neu veröffentlichten Standardvertragsklauseln der Europäischen Kommission, um für die Kunden den Schutz der personenbezogenen Daten, die Nuance als Auftragsverarbeiter anvertraut wurden, zu gewährleisten.

Nuance hat die notwendigen technischen und organisatorischen Maßnahmen ergriffen, die gewährleisten, dass die Daten, nach den höchsten international anerkannten Sicherheitsstandards geschützt werden.




Personenbezogene Daten der besonderen Kategorie, die von Dragon Medical One (Deutschland) verarbeitet werden, nämlich Gesundheitsdaten, die in Audios und Texten enthalten sind, werden nur von Nuance-Einrichtungen in der Europäischen Union verarbeitet.

## Unterauftragsverarbeiter Hosted Services (Dragon Medical One, Dragon Medical Speech Kit Hosted, PowerMic Mobile)

| Name des Unternehmens | Land der Verarbeitung und Kontaktdaten | Art des Supports und/oder der Verarbeitung |
|---|---|---|
| Nuance Communications, Inc. | 1 Wayside Road<br>Burlington, MA 01880<br>Vereinigte Staaten<br><br>Chief Privacy Officer<br>privacy@nuance.com | Geschäftliche Kontaktinformationen (keine Verarbeitung von Gesundheitsdaten) zwecks: Support-Ticket-Management, Fehlerbehebung, Analysen für Hosted-Services, Kundenbeziehungsmanagement. |
| Nuance India Pvt. Ltd. | No. 15/1A and No. 14/P7<br>Kadubeesanahalli, Varthur Hobli<br>Bangalore, Karnataka 560103,<br>Indien<br><br>Chief Privacy Officer<br>privacy@nuance.com | Geschäftliche Kontaktinformationen (keine Verarbeitung von Gesundheitsdaten) zwecks: Support-Ticket Management und Betriebsanalytik. |
| Nuance Communications Austria GmbH | EURO PLAZA Building 2D<br>Technologiestrasse 8<br>1120 Wien<br>Österreich<br><br>Chief Privacy Officer<br>privacy@nuance.com | Analyse von Daten, um die Spracherkennung, das Natural- language understanding (NLU) und andere Komponenten der Software und Technologien von Nuance, die in den Dienstleistungen enthalten sind, zu entwickeln, zu trainieren, abzustimmen, zu erweitern und zu verbessern. |

| Name des Unternehmens | Land der Verarbeitung und Kontaktdaten | Art des Supports und/oder der Verarbeitung |
|---|---|---|
| Nuance Communications Ibérica SA. | Calle Gran Vía, 39<br>8th floor Madrid 28013,<br>Spanien<br><br>Chief Privacy Officer<br>privacy@nuance.com | Support-Ticket-Management, Fehlerbehebung, Analysen für Hosted Services, Support von 09:00 Uhr bis 17:00 Uhr an Werktagen. |
| Nuance Communications GmbH / Nuance Communications Healthcare Germany GmbH | Sonnenweg 11b,<br>52070 Aachen,<br>Deutschland<br><br>Chief Privacy Officer<br>privacy@nuance.com | Lokaler Support (Sprachunterstützung, Wartung und Support von Lizenzsoftware, Anwendungsentwicklung, -tests und -support, Tuning und Optimierung der automatischen Spracherkennung und des Natural-language understanding (NLU); Kundenkontakt und Support. |
| Nuance Communications Belgium Ltd | Merelbeke, 9820,<br>Belgien<br><br>Chief Privacy Officer<br>privacy@nuance.com | Lokaler Support (Sprachunterstützung, Wartung und Support von Lizenzsoftware, Anwendungsentwicklung, -tests und -support, Tuning und Optimierung der automatischen Spracherkennung und des Natural-language understanding (NLU); Kundenkontakt und Support. |
| Microsoft Corporation und Tochtergesellschaften | One Microsoft Way<br>Redmond, Washington<br>98052<br>Vereinigte Staaten<br><br>www.microsoft.com | MS Azure Platform Dienste für das Hosting von Dragon Medical One, Dragon Medical SpeechKit Hosted, PowerMic Mobile.<br><br>Hosting in Deutschland (für deutsche und österreichische Kunden) und Hosting zu Forschungs- und Entwicklungszwecken in den Niederlanden und/oder Irland. |

## Dritte Unterauftragsverarbeiter

| Name des Unternehmens | Land der Verarbeitung und Kontaktdaten | Art des Supports und/oder derVerarbeitung |
|---|---|---|
| Salesforce.com, Inc. und Tochtergesellschaften | 415 Mission Street<br>San Francisco, CA 94105<br>Vereinigte Staaten<br><br>www.salesforce.com | Software und Plattform für das Kundenbeziehungsmanagement; Plattform für Wartung und das Support-Ticketing-System. |
| Qualtrics | 333 River Park Dr Provo<br>UT, 84604-5787<br>Vereinigte Staaten<br><br>www.qualtrics.com | Bearbeitung sowie Verwaltung von Kundenumfragen u.a. nach Abschluss von Supportanfragen. |
| Twilio Inc. | 375 Beale Street Suite 300<br>San Francisco<br>CA 94105<br>Vereinigte Staaten<br><br>www.twilio.com | Kommunikationstool mit Kunden für die Verwaltung von Aktualisierungen, Benachrichtigungen und ähnlichen Informationen. |

Die aktuelle Liste der Unterauftragsverarbeiter für Hosted Services wird von Nuance jeweils hier veröffentlicht.

## Ort der Niederlassung

Nuance ist innerhalb der EU/des EWR an folgendem Standort ansässig:
Nuance Communications Ireland Limited
The Harcourt Building,
57B Harcourt Street, Dublin 2,
D02 F721, Irland

**Weitere Informationen:**
https://www.nuance.com/de-de/about-us/trust-center/privacy.html

**Über Nuance Communications, Inc.**
Nuance Communications ist Technologie-Pionier und Marktführer im Bereich der dialogorientierten KI und Ambient Intelligence. 77 Prozent der Krankenhäuser in den USA und 85 Prozent aller Fortune-100 Unternehmen weltweit vertrauen Nuance als Full-Service-Partner. Wir liefern intuitive Lösungen, die Menschen ermöglichen, andere zu unterstützen. Nuance ist ein Unternehmen von Microsoft.

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HC_5111_04_WP, August 11, 2022_GER_GERMANY

White paper

# Globale Ressourcen und Datensicherheit

NUANCE

# Nuance gewährleistet seinen Kunden auf der ganzen Welt höchste Datensicherheit.

## Ressourcen für Sicherheit, Compliance und Zuverlässigkeit.

## Einführung

Bei Nuance verbinden wir auf neue Art und Weise Menschen und Technik mit Hilfe von intelligenten und intuitiven KI-basierten Lösungen. Wir arbeiten intensiv daran, das Vertrauen unserer Kunden aufzubauen, zu pflegen und zu stärken.

Die Lösungen von Nuance werden weltweit von immer mehr Gesundheitseinrichtungen eingesetzt. Um diesen wachsenden globalen Kundenstamm zu unterstützen, hat Nuance zusätzlich, zu seiner Aktivität in Nordamerika, geschäftsnotwendige Standorte, F&E- sowie Supportteams in den Regionen LATEAM, APAC und EMEA etabliert und ausgebaut.

Gegenwärtig befindet sich mehr als die Hälfte aller Nuance Organisationen außerhalb der USA. Mit Niederlassungen in 23 Ländern stellt Nuance seine Lösungen und wichtigen Ressourcen auf der ganzen Welt zur Verfügung. Wir bieten unseren Kunden eine ganzheitlich, weltweit verfügbare Lösung. Das umfasst unsere führenden KI-basierten Produkte und Dienstleistungen, z. B. Dragon Medical-Lösungen.

Das Herzstück unserer Dragon Medical-Lösungen bildet die KI-basierte Technologie, die eine natürliche Sprachverarbeitung ermöglicht. Damit unsere Systeme die menschliche Kommunikation besser verstehen können, bieten unsere globalen Expertenteams verschiedene Services. Diese umfassen z. B. Kommentarfunktionen und Analysen, um die Spracherkennung weiter zu entwickeln, erweitern, aktualisieren und zu verbessern. Die Bedeutung, bis hin zur kritische Notwendigkeit, von Nuance Produkten wurde während der globalen Pandemie COVID-19 deutlich. Während dieser Zeit hat sich bewiesen, dass technologische Innovationen einen wesentlichen Anteil leisten, Gesundheitsversorgung und andere kritische Dienste bereitzustellen. Aber mit zunehmender Nachfrage nach diesen Dienstleistungen, sind auch die Sicherheitsbedrohungen im Zusammenhang mit der Bereitstellung der Lösungen, angestiegen. Daher betreibt Nuance seine Innovationen parallel. So kann sichergestellt werden, dass Systeme und Richtlinien, die der Sicherheit und des Schutzes von Kunden- und Patientendaten dienen, eingehalten werden.

## Data-Governance-Strategie

Kunden vertrauen Nuance als weltweit führendes Unternehmen im Bereich der dialogorientierten KI. Vor allem hinsichtlich Lösungen, die einen verantwortungsvollen Umgang mit Patienten- und Verbraucherdaten garantieren. Wir verpflichten uns, unsere Kunden weltweit bei der Einhaltung gesetzlicher Datenschutzbestimmungen zu unterstützen. Um dies effizient umzusetzen hat Nuance das Data-Governance-Programm etabliert. Es regelt im gesamten Unternehmen die Erstellung, Zuverlässigkeit, Rückverfolgbarkeit, Qualität, Integrität, Freigabe, Schutz und Nutzung von Daten.

**Unser Programm umfasst:**

– **Dateneigentum und -verantwortlichkeit:** Jeder bei Nuance erfasste Datensatz hat einen Datenverantwortlichen. Dieser ist dafür verantwortlich, festzulegen, wer auf das entsprechende System oder einen Datensatz zugreifen kann. Außerdem trägt er die Verantwortung für Sicherheitsanforderungen, Qualitätsstandards und Datendefinitionen, wie z. B. die Klassifizierung. Darüber hinaus ist er verantwortlich, eine Datenübersicht zu führen, in der die entsprechenden Nuance-Daten dokumentiert sind, die vom System verarbeitet werden. Des Weiteren muss er ein entsprechendes Verarbeitungsprotokoll erstellen, das sämtliche Datenbewegungen dokumentiert.

– **Standardisierte Richtlinien und Verfahren:** Die Richtlinien und Verfahren werden von Fachexperten überprüft und so abgestimmt, dass sie die verschiedenen Aspekte eines ganzheitlichen Programms zur Datenverwaltung unterstützen – einschließlich Datenschutz, -sicherung und -sicherheit. Die Nuance Fachexperten verfolgen die Entwicklungen in der Datenschutzgesetzgebung kontinuierlich, damit die Richtlinien und Verfahren von Nuance immer dem aktuellen Stand entsprechen.
– **Einheitliches Datenqualitätsmanagement:** Dass der Auftragsverarbeiter die Vollständigkeit und Qualität von Kundendaten gewährleistet, ist einerseits entscheidend für die Erfüllung der Kundenerwartungen und andererseits für die Einhaltung gesetzlicher und behördlicher Anforderungen.
– **Change-Management:** Nuance führt Datenschutz-Folgenabschätzungen für neue oder wesentlich geänderte Verfahren, Weitergaben oder Nutzungen von personenbezogenen Daten durch, um sicherzustellen, dass diese Verarbeitungen sowohl unseren vertraglichen Verpflichtungen als auch den gesetzlichen Bestimmungen entsprechen.
– **Datenauswertung und -überwachung:** Nuance bewertet all seine Prozesse, Verfahren und Systeme regelmäßig, um sicherzustellen, dass Aktualisierungen und Verbesserungen zur Einhaltung der Branchenstandards umgesetzt werden.
– **Schulung und Kommunikation:** Nuance führt mindestens einmal jährlich (bei Bedarf auch öfter) Schulungen durch, um sicherzustellen, dass sich die Mitarbeiter über ihre Aufgaben und Verantwortlichkeiten im Zusammenhang mit der Datenverwaltung bewusst sind.

Bei jeder Datenverarbeitung, ob cloudbasiert oder vor Ort, wird die Verantwortung für den Datenschutz (einschließlich des Zugriffs und der Kontrollen) gemeinsam wahrgenommen. Unsere Kunden sind dafür verantwortlich, die Nuance-Lösungen so einzusetzen, dass sie die Data Governance-Bemühungen unterstützen, sowie im Einklang mit den geltenden Richtlinien in ihren Unternehmen umzusetzen.

## Datenschutz-Grundverordnung (DSGVO)

Nuance unterstützt als globaler Branchenführer im Bereich der dialogorientierten KI Kunden aus dem öffentlichen und privaten Sektor mit Lösungen für das Gesundheitswesen, Omni-Channel-Lösungen für die Kundenbetreuung sowie Lösungen zur Spracherkennung. Während wir für unsere Produkte, die direkt an Verbraucher gerichtet sind, als Verantwortlicher agieren, vertrauen die meisten Kunden von Nuance ausschließlich auf unsere Dienste als Auftragsverarbeiter. In beiden Fällen ist es uns wichtig, Lösungen bereitzustellen, die mit den geltenden Datenschutzgesetzen konform sind.

Die kürzlich ergangene Entscheidung des Europäischen Gerichtshofs im Fall „Schrems II“ hat Nuance dazu bewegt, die für internationale Vorgänge notwendigen Datenübermittlungen zu evaluieren. Nuance verwendet Standardvertragsklauseln und wird diese beibehalten. Gemäß den Vorgaben des Europäischen Datenschutzausschusses hat Nuance den notwendigen Prozess implementiert, um die Bedingungen von Datenübermittlungen zu prüfen, die gemäß diesen Standardvertragsklauseln durchgeführt wurden und die ausreichenden Schutz für die von den Kundenverträgen geforderten Datenverarbeitungen bieten. Nuance ist überzeugt, dass sein Prozess den Vorgaben des Ausschusses entspricht. Zudem hält sich Nuance auch weiterhin an seine Privacy-Shield-Zertifizierung – nicht aufgrund gesetzlicher Vorgaben, sondern im Rahmen der eigenen Datenschutzverpflichtung.

In Anerkennung der DSGVO als globales Datenschutzmodell hat Nuance seine Systeme und Prozesse angepasst, um die strengen Anforderungen dieser Verordnung zu erfüllen. Wir sind weiterhin bestrebt, unsere Kunden bei der Einhaltung von aktuellen und sich entwickelnden Datenschutzverordnungen zu unterstützen. Nach wie vor werden wir unsere Systeme kontinuierlich überwachen und gegebenenfalls anpassen.

**Nuance Beitrag zur Einhaltung der DSGVO:**
– Regelmäßige Prüfung bestehender Richtlinien, Prozesse und Systeme, ob alle Datenschutzrichtlinien eingehalten werden; insbesondere da sich die DSGVO durch Gerichtsentscheidungen und Richtlinien ständig weiterentwickelt.
– Aufzeigen, wo die Kundendaten in unseren Systemen verarbeitet werden und wer Zugriff darauf hat.
– Unterstützung bei der Verwaltung von Einwilligungen, einschließlich Opt-outs.
– Unterstützung bei Anfragen von betroffenen Personen zu Auskunft, Berichtigung, Einschränkung der Verarbeitungen und Löschung ihrer Daten.
– Durchführung von Datenschutz-Folgenabschätzungen für neue Produkte, Systeme und Regionen.
– Einhaltung der entsprechenden Aufbewahrungsfristen.
– Verschlüsselung von gespeicherten Daten und sichere, verschlüsselte Datenübertragung zwischen Nuance und den Kundensystemen.
– Nuance unterstützt seine Kunden ihre Datenverarbeitung weiterzuentwickeln und zu warten.
– Anwendung von Sicherheitsverfahren, Zugangs- und Zugriffskontrollen sowohl seitens Nuance als auch auf Kundenseite.
– Sicherstellung, dass Unterauftragsverarbeiter und Verträge gemäß den DSGVO-Anforderungen ordnungsgemäß überprüft werden.
– Gewährleistung der kontinuierlichen Verfügbarkeit und Integrität von Daten.

Bei allen Lösungen, ob cloudbasiert oder vor Ort, wird die Verantwortung für den Datenschutz gemeinsam wahrgenommen. Unsere Kunden sind dafür verantwortlich, die Nuance-Lösungen so einzusetzen, dass sie den DSGVO Anforderungen entsprechen. Ebenso sind die DSGVO-Anforderungen in ihren Unternehmen umzusetzen.

## Geschäftskontinuität und Notfallwiederherstellung

Nuance hat ein Programm für Geschäftskontinuität und Notfallwiederherstellung entwickelt, um wichtige Geschäftsabläufe und -systeme im Fall einer kritischen Betriebsunterbrechung zeitnah wiederherzustellen und fortzusetzen. Wir sind stets um die Sicherheit und das Wohlergehen des Einzelnen bemüht und setzen uns dafür ein, weltweit die höchste Serviceverfügbarkeit zu erreichen.

Unser Programm für Geschäftskontinuität „Business Continuity Management“ (BCM) umfasst verschiedene Komponenten, um Störungen zu erkennen und darauf zu reagieren. Dazu gehören:

– Analyse der geschäftlichen Auswirkungen
– Strategien für die Geschäftskontinuität
– Strategien für die Notfallwiederherstellung
– Tests
– Reaktion auf einen Vorfall

## Governance, Risikomanagement und Compliance

Das Governance-, Risikomanagement- und Compliance-Team (GRC-Team) sorgt dafür, dass Fähigkeiten, Richtlinien, Bewertungen sowie Kontrollen aufeinander abgestimmt sind. Damit gewährleisten wir in allen Unternehmensbereichen eine zuverlässige Datensicherheit, umfassendes Risikomanagment sowie die Einhaltung von Branchensicherheitsstandards. Unser Ansatz umfasst folgende Bereiche: Nuance reagiert schnell auf Kundenanfragen sowie Anfragen hinsichtlich Bescheinigungen für Audits, Zertifizierungen oder anderen Sicherheitsthemen. Durch den engen Austausch mit unseren Kunden, kann das GRC-Team alle relevanten Sicherheitsaspekte für unsere Produkte und Dienstleistungen besser umsetzen. Nuance arbeitet kontinuierlich daran Sicherheitszertifikate für unsere verschiedenen Produkte und Dienstleistungen zu erreichen und zu behalten. Mit diesen Zertifikaten von Branchen- und Normierungsorganisationen möchten wir die Sicherheitsanforderungen unserer Kunden bedienen. Unsere Zertifizierungen: AICPA, SOC 2, HITRUST und ISO-27001.

Nuance hat ein weiters Programm, um die Sicherheitsrisiken gegenüber Drittanbietern zu managen. Es erfordert eine formale Sicherheitsrisikobewertung vor der Aufnahme von Geschäftsbeziehungen mit Partnern, Lieferanten und anderen, die technischen Zugriff auf unsere Netzwerke benötigen. Alle Beteiligten müssen vertrauliche Informationen sorgfältig und angemessen schützen, den Zugriff darauf genau kontrollieren und Datenschutzgesetze sowie -vorschriften einhalten.

Der Nuance Global Protection Service hat die Aufgabe, die Gesundheit und das Wohlbefinden unserer Mitarbeiter zu wahren, unsere Arbeitsstätten vor unbefugtem Zutritt zu schützen, sowie Daten, Vermögensgegenstände und geistiges Eigentum zu sichern.

Nuance sorgt für die Aufrechterhaltung der Geschäftskontinuität und Serviceverfügbarkeit, indem es unternehmensweite Strategien und Prozesse entwickelt und umsetzt, um jederzeit vorbereitet und einsatzbereit zu sein. Dazu gehört die Unterbringung von Rechenzentren in robusten Umgebungen mit Failover- und Redundanzfunktionen, die ungünstigen Bedingungen, unerwarteten Ereignissen sowie physischen und umgebungsbedingten Bedrohungen standhalten können. Wir überwachen kritische Ereignisse in Echtzeit und verwalten unerwartete Vorfälle bis zu ihrer Lösung. Nuance hält sich an das NIST-Framework, um das Krisenmanagement mit lokalen und regionalen Behörden abzustimmen. Das beinhaltet die Erfüllung und Unterstützung aller relevanter Richtlinien hinsichtlich Sicherheit und Datenschutz von Informationen und Informationssysteme der staatlichen Behörden.

**Sicherheitsabteilung, Risikoanalyse und Risikomanagement**
Nuance hat eine Abteilung für professionelle Informationssicherheit eingerichtet, die unter Leitung eines Chief Security Officer und eines Chief Information Security Officer hochmoderne Informationssicherheitskontrollen für Produkte und Dienstleistungen von Nuance durchführt. Nuance überprüft jährlich die Einhaltung der Sicherheitskontrollen und ihre Übereinstimmung mit den branchenüblichen Vorgaben.

**Personalüberprüfung, Schulung und Sanktionen**
Alle Nuance-Mitarbeiter werden einer Hintergrundüberprüfung unterzogen, bevor ihnen der Zugriff auf Daten gestattet wird. Das gesamte Personal erhält regelmäßige Sicherheitsschulungen. Nuance hat Regelungen und Prozesse eingeführt, um Sanktionen gegen Mitarbeiter zu verhängen, die sich nicht an die Sicherheitsrichtlinien und Verfahren von Nuance halten.

**Physische Kontrollen**
Alle Nuance Standorte sind durch physische Sicherheitskontrollen geschützt, z.B. durch elektronische Zugangssysteme, Schlösser und Kameras. Nuance speichert alle Produktionsdaten in physisch gesicherten Rechenzentren, die durch zusätzliche Zugangsbeschränkungen geschützt sind, z.B. sekundäre Authentifizierungs- und Zugangskontrollsysteme. Unsere Infrastruktursysteme sind so konzipiert, dass einzelne Ausfallpunkte eliminiert und Auswirkungen möglicher Umweltrisiken minimiert werden.

Cloudbasierte Rechenzentren – Microsoft Azure wird in Rechenzentren gehostet, die von Microsoft verwaltet und betrieben werden. Diese geografisch voneinander getrennten Rechenzentren erfüllen die wichtigsten nationalen und internationalen Branchenstandards, wie etwa ISO/IEC 27001:2013 und NIST SP 800-53, bezüglich Sicherheit und Zuverlässigkeit. Die Verwaltung und Überwachung der Rechenzentren erfolgt durch Mitarbeiter von Microsoft. Microsoft ist für die Bereitstellung der weltweit größten, täglich rund um die Uhr verfügbaren Onlinedienste und seine hohen Sicherheitsstandards bekannt. Mehr Informationen finden Sie hier: https://docs.microsoft.com/de-de/azure/security/fundamentals/shared-responsibility.

**Zugriff**
Nuance hat alle Geräte, auf denen personenbezogene Daten gespeichert sind, in Bereichen mit Zugriffskontrollen untergebracht. Nuance erlaubt nur Mitarbeitern und vorübergehend Beschäftigten mit einem geschäftlichen Auftrag den Zugriff auf diese kontrollierten Bereiche.

**Zugriffspunkte**
Die nach außen gerichteten Webserver von Nuance und Zugriffspunkte von Drittanbietern sind sicher konfiguriert. Dazu gehören insbesondere die Implementierung einer ordnungsgemäß aufgebauten, dedizierten Firewall, die Durchführung einer Virenprüfung, bevor Zugriff auf das Netzwerk eines Drittanbieters gewährt wird, und die Deaktivierung oder Entfernung von Routing-Prozessen zur Minimierung von Zugriffen.

**Netzwerksicherheit**
Nuance hat angemessene zusätzliche Sicherheitsmaßnahmen implementiert, um personenbezogene Daten vor den spezifischen, mit den Services verbundenen Risiken zu schützen. Alle Daten werden bei ihrer Übertragung über öffentliche Netzwerke durch Verschlüsselung geschützt. Daten im Ruhezustand werden entweder durch Verschlüsselung oder durch kompensierende Sicherheitskontrollen geschützt, wie etwa Netzwerksegmentierung, Architekturabstufung, Firewalls mit Intrusions- und Anti-Malware-Schutz und Begrenzung des Zugriffs.

**Mobilgeräte**
Nuance speichert keine personenbezogenen Daten auf mobilen Geräten oder Medien (insbesondere Laptops, externe Festplatten, USB- oder Flash-Laufwerke, Smartphones, DVDs, CDs oder Magnetbänder), es sei denn, diese sind mindestens durch 128-Bit-Verschlüsselung oder eine höhere Verschlüsselung gemäß den aktuellen branchenüblichen Best Practices geschützt.

**Überwachung**
Nuance ergreift angemessene Maßnahmen zur Überwachung der Sicherheit personenbezogener Daten und ggf. zur Identifizierung von Mustern verdächtiger Aktivitäten. Nuance entwickelt Anwendungen und Services, um von Nuance gespeicherte zur Identifizierung einer Person verwendbare Daten zu löschen. Bei jeder erkannten Änderung gehosteter Daten überprüfen die Sicherheits- und QA-Teams die Daten-Mapping-Anforderungen, um das Löschen vertraulicher Daten in den betroffenen Datenfeldern zu validieren. Nuance überwacht außerdem Sicherheitsvorfälle in Verbindung mit der Anmeldung, wie nicht befugte oder fehlgeschlagene Anmeldeversuche.

## Fazit

Bei Nuance gewährleisten wir kontinuierliche Weiterentwicklung, umfassende Sicherheitsstrategien und entsprechende Kontrollen, damit die uns anvertrauten Gesundheitsdaten vertraulich und geschützt bleiben. Unsere Sicherheitsverfahren kombiniert mit der hochverfügbaren und redundanten Infrastruktur bieten unseren Kunden genau den schnellen, sicheren und kontinuierlichen Service, den sie erwarten und den ihre Patienten verdienen. Weitere Informationen finden Sie unter https://www.nuance.com/de-de/about-us/trust-center.html

**Über Nuance Communications Inc.**
Nuance Communications ist Pionier und Marktführer im Bereich der dialogorientierten KI für alle Arbeits- und Lebensbereiche. Das Unternehmen liefert Lösungen, die verstehen, analysieren und reagieren, mit dem Ziel die menschliche Intelligenz zu bereichern sowie Produktivität und Sicherheit zu erhöhen. Nuance besitzt jahrzehntelange Erfahrung in der Entwicklung und Anwendung von KI und bietet Lösungen u.a. für das Gesundheits- und Rechtswesen, die Finanz- und Versicherungsbranche, Telekommunikation und Versorgungswirtschaft. Tausende von Unternehmen arbeiten mit Nuance zusammen für eine intelligentere, vernetztere Welt. Weitere Informationen finden Sie unter nuance.de.

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NUAN–HC–Sec_WP_DE, August 2020

# Zertifikat

Prüfungsnorm **ISO/IEC 27001:2013**

Zertifikat-Registrier-Nr. **01 153 2000206**

Unternehmen:

**Nuance Communications Ireland Ltd**
The Harcourt Building
57B HARCOURT STREET, 4th Floor
DUBLIN 2
D02 F721
Irland

mit den Standorten gemäß Anlage

Geltungsbereich: Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse".
Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards.
Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020

Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO/IEC 27001:2013 erfüllt sind.

Gültigkeit: Dieses Zertifikat ist gültig vom 18.11.2020 bis 17.11.2023.

18.11.2020

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

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Prüfungsnorm **ISO/IEC 27001:2013**

Zertifikat-Registrier-Nr. **01 153 2000206**

| Nr. | Standort | Geltungsbereich |
|---|---|---|
| /001 | Nuance Communications Ireland Ltd<br>The Harcourt Building<br>57B HARCOURT STREET, 4th Floor<br>DUBLIN 2<br>D02 F721<br>Irland | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |
| /002 | Nuance Communications UK Limited<br>33 SOHO SQUARE<br>LONDON<br>W1D 3QU<br>Vereinigtes Königreich | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |
| /003 | Nuance Communications Australia Pty Limited<br>124 WALKER ST<br>NORTH SYDNEY NSW 2060<br>Australien | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |





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| | | |
|---|---|---|
| /004 | Nuance Communication France Sarl<br>13/15 Rue Taitbout<br>75009 Paris<br>Frankreich | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |
| /005 | Nuance Communications Healthcare Austria GmbH<br>Technologiestraße 8<br>Euro Plaza 2D<br>1120 Vienna-Meidling<br>Österreich | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |





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| | | |
|---|---|---|
| /006 | Nuance Communications GmbH<br>Sonnenweg 11b<br>52070 Aachen<br>Deutschland | Der Geltungsbereich umfasst "die Entwicklung, Lieferung, Wartung und Unterstützung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & eScription One Software als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards. Erklärung zur Anwendbarkeit (SOA) Version 1.0 vom 25. Februar 2020 |

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# Zertifikat

Prüfungsnorm **ISO/IEC 27001:2013**

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Unternehmen:

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D02 F721
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mit den Standorten gemäß Anlage

Geltungsbereich: Der Geltungsbereich umfasst "die Entwicklung und Lieferung von Dragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & Winscribe Digital Dictation als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice Prozesse". Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards.
Erklärung zur Anwendbarkeit (SOA) Version 3.0 vom 31. August 2021.

Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO/IEC 27001:2013 erfüllt sind.

Gültigkeit: Dieses Zertifikat ist gültig vom 18.11.2020 bis 17.11.2023.

05.01.2022 (Änderung)

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| Nr. | Standort | Geltungsbereich |
|---|---|---|
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| /006 | c/o Nuance Communications<br>Healthcare Germany GmbH<br>Jülicher Str. 376<br>52070 Aachen<br>Deutschland | Der Geltungsbereich umfasst "die Entwicklung und Lieferung vonDragon Medical One (DMO), Dragon Medical Advisor (DMA), Dragon Medical Server (DMS), Dragon Medical Workflow Manager (DMWM) & Winscribe Digital Dictation als Cloud Services, die in Großbritannien, Frankreich, Deutschland und Australien gehostet werden, einschließlich aller dafür notwendigen Backoffice-Prozesse".Der ISMS-Umfang umfasst alle Anforderungen des ISO 27001-Standards<br><br>Erklärung zur Anwendbarkeit (SOA) Version 3.0 vom 31. August 2021. |

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# Microsoft Corporation - Azure Including Dynamics 365

## (Azure & Azure Government)

**System and Organization Controls (SOC) 2 Report**

April 1, 2021 to March 31, 2022

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# Executive Summary

| Microsoft Azure | |
|---|---|
| **Scope** | Microsoft Azure, Microsoft Dynamics 365 and Microsoft Datacenters |
| **Period of Examination** | April 1, 2021 to March 31, 2022 |
| **Applicable Trust Services Criteria** | Security, Availability, Processing Integrity, and Confidentiality |
| **Additional Criteria** | • Cloud Security Alliance's Cloud Controls Matrix (CCM) Version 3.0.1<br>• Bundesamt für Sicherheit in der Informationstechnik (BSI) Cloud Computing Compliance Criteria Catalogue (C5) version published in January 2020 |
| **Datacenter Location(s)** | **Americas**<br>• West US<br>• West US 2<br>• West US 3<br>• West Central US<br>• Central US<br>• USGOV Iowa<br>• North Central US<br>• USGOV Arizona<br>• South Central US<br>• USGOV Texas<br>• East US<br>• East US 2<br>• USGOV Virginia<br>• USGOV Wyoming<br>• Canada East<br>• Canada Central<br>• Brazil South<br>• Brazil Southeast<br>**APAC**<br>• Australia East<br>• Australia Southeast<br>• Australia Central<br>• Australia Central 2<br>• West India<br>• Central India<br>• Jio India West<br>• Jio India Central<br>• South India<br>• East Asia<br>• Japan West<br>• Japan East<br>• Southeast Asia<br>• Korea South<br>• Korea Central<br>**EMEA**<br>• West Europe<br>• North Europe<br>• UK South<br>• UK West<br>• France Central<br>• France South<br>• Germany North<br>• Germany West Central<br>• Germany Central<br>• Switzerland West<br>• Switzerland North<br>• Norway East<br>• Norway West<br>• Sweden Central<br>• South Africa North<br>• South Africa West<br>• UAE Central<br>• UAE North |

| | | |
|---|---|---|
| **Edge Sites** | • Ashburn, VA (ASH)<br>• Athens, Greece (ATH01)<br>• Atlanta, GA (ATA)<br>• Auckland, New Zealand (AKL30)<br>• Bangkok, Thailand (BKK30)<br>• Barcelona, Spain (BCN30)<br>• Barueri, Brazil (GRU30)<br>• Berlin, Germany (BER30)<br>• Bogota, Colombia (BOG30)<br>• Boston, MA (BOS01/31)<br>• Brisbane, Australia (BNE01)<br>• Brussels, Belgium (BRU30)<br>• Bucharest, Romania (BUH01)<br>• Budapest, Hungary (BUD01)<br>• Buenos Aires, Argentina (BUE30)<br>• Busan, South Korea (PUS03)<br>• Cairo, Egypt (CAI30)<br>• Cape Town, South Africa (CPT02)<br>• Chennai, India (MAA02)<br>• Chicago, IL (CHG, CHI30)<br>• Copenhagen, Denmark (CPH30)<br>• Dallas, TX (DAL, DFW30)<br>• Denver, CO (DNA)<br>• Detroit, MI (DTT30)<br>• Dubai, United Arab Emirates (DXB30)<br>• Dusseldorf, Germany (DUS30)<br>• Frankfurt, Germany (FRA/31)<br>• Geneva, Switzerland (GVA30)<br>• Helsinki, Finland (HEL03)<br>• Ho Chi Minh City, Vietnam (SGN30)<br>• Hong Kong (HKB, HKG30)<br>• Honolulu, HI (HNL01)<br>• Houston, TX (HOU01)<br>• Hyderabad, India (HYD30)<br>• Istanbul, Turkey (IST30)<br>• Jakarta, Indonesia (JKT30)<br>• Jacksonville, FL (JAX30)<br>• Johannesburg, South Africa (JNB02)<br>• Kiev, Ukraine (IEV30)<br>• Kuala Lumpur, Malaysia (KUL02/30)<br>• Las Vegas, NV (LAS01/30)<br>• Luanda, Angola (LAD30)<br>• Lisbon, Portugal (LIS01)<br>• London, United Kingdom (LON04/LTS)<br>• Los Angeles, CA (LAX/31)<br>• Lagos, Nigeria (LOS30) | • Manila, Philippines (MNL30)<br>• Memphis, TN (MEM30)<br>• Miami, FL (MIA)<br>• Milan, Italy (MIL30)<br>• Minneapolis, MN (MSP30)<br>• Montreal, Canada (YMQ01)<br>• Moscow, Russia (MOW30)<br>• Mumbai, India (BOM02)<br>• Munich, Germany (MUC30)<br>• Nairobi, Kenya (NBO30)<br>• Nashville, TN (BNA30)<br>• New Delhi, India (DEL01)<br>• New York City, NY (NYC)<br>• Newark, NJ (EWR30)<br>• Osaka, Japan (OSA30/31)<br>• Oslo, Norway (OSL30)<br>• Palo Alto, CA (PAO)<br>• Paris, France (PAR02/PRA)<br>• Perth, Australia (PER01/30)<br>• Philadelphia, PA (PHL30)<br>• Phoenix, AZ (PHX01/31)<br>• Portland, OR (PDX31)<br>• Prague, Czech Republic (PRG01)<br>• Queretaro, Mexico (MEX30/31)<br>• Rabat Morocco (RBA30)<br>• Rio de Janeiro (RIO02/03)<br>• Rome, Italy (ROM30)<br>• Sao Paulo, Brazil (SAO03/31)<br>• Salt Lake City, UT (SLC31)<br>• San Diego, CA (SAN30)<br>• San Jose, CA (SJC)<br>• Santiago, Chile (SCL30)<br>• Seattle, WA (WST, STB)<br>• Seoul, South Korea (SLA)<br>• Singapore (SGE, SIN30, SG1)<br>• Sofia, Bulgaria (SOF01)<br>• Stockholm, Sweden (STO)<br>• Taipei, Taiwan (TPE30/31)<br>• Tampa, FL (TPA30)<br>• Tel Aviv, Israel (TLV30)<br>• Tokyo, Japan (TYA/TYB)<br>• Toronto, Canada (YTO01/30)<br>• Vancouver, Canada (YVR30)<br>• Warsaw, Poland (WAW01) |

| | | |
|---|---|---|
| | • Madrid, Spain (MAD30)<br>• Manchester, United Kingdom (MAN30) | • Zagreb, Croatia (ZAG30)<br>• Zurich, Switzerland (ZRH) |
| **Subservice Providers** | N/A | |
| **Opinion Result** | Unqualified | |
| **Testing Exceptions** | 5 | |

# Section I:
# Independent Service Auditor's Report for the Security, Availability, Processing Integrity, and Confidentiality Criteria, CCM Criteria, and C5

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# Section I: Independent Service Auditor's Report for the Security, Availability, Processing Integrity, and Confidentiality Criteria, CCM Criteria, and C5

Microsoft Corporation
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Redmond, WA 98052-6399

## *Scope*

We have examined the attached description of the system of Microsoft Corporation (the "Service Organization" or "Microsoft") related to in-scope services and offerings for Microsoft Azure, Microsoft Dynamics 365, and Microsoft datacenters ("Azure") for the Azure and Azure Government cloud environments[1] throughout the period April 1, 2021 to March 31, 2022 (the "Description") based on the criteria for a description of a service organization's system set forth in DC Section 200, *2018 Description Criteria for a Description of a Service Organization's System in a SOC 2® Report* ("description criteria"), and the suitability of the design and operating effectiveness of controls stated in the Description throughout the period April 1, 2021 to March 31, 2022 to provide reasonable assurance that Microsoft's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality ("applicable trust services criteria")[2] set forth in TSP Section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy.* We have also examined the suitability of the design and operating effectiveness of controls to meet the criteria set forth in the Cloud Security Alliance's (CSA) Cloud Controls Matrix (CCM) Version 3.0.1 control specifications ("CCM criteria") and the objectives set forth in the Bundesamt für Sicherheit in der Informationstechnik (BSI) Cloud Computing Compliance Criteria Catalogue ("C5") version published in January 2020. BSI requires an attestation in order for the service provider to be considered certified as having met the objectives set forth in the BSI's C5.

The information included in Section V, "Supplemental Information Provided by Microsoft" is presented by management of Microsoft to provide additional information and is not a part of the Description. Information included in Section V describing Service Organization's Compliance, Infrastructure Redundancy and Data Durability, Data Backup and Recovery, E.U. Data Protection Directive, Additional Resources, Management's Response to Exceptions Noted, and User Entity Responsibilities have not been subjected to the procedures

[1] In-scope services and offerings and coverage periods are defined in the *Azure and Azure Government Report Scope Boundary* and *Internal Supporting Services* subsections in Section III of this SOC 2 report. Applicability of the Processing Integrity Trust Services Criteria is defined in *the Azure and Azure Government Report Scope Boundary* subsection in Section III of this SOC 2 report. In-scope datacenters, edge sites, and coverage periods are defined in the *Regions Covered by this Report* subsection in Section III of this SOC 2 report.

[2] Applicable trust services criteria for Microsoft datacenters are Security and Availability.

applied in the examination of the Description and the suitability of the design and operating effectiveness of the controls, to achieve (a) Microsoft's service commitments and system requirements based on the applicable trust services criteria; (b) the CCM criteria; and (c) the objectives set forth in C5.

### *Service Organization's Responsibilities*

Microsoft is responsible for its service commitments and system requirements and for designing, implementing, and operating effective controls within the system to provide reasonable assurance that Microsoft's service commitments and system requirements were achieved. Microsoft has provided the accompanying assertion titled "Microsoft Azure's Management Assertion" (the "assertion") about the Description and the suitability of design and operating effectiveness of controls stated therein. Microsoft is also responsible for preparing the Description and assertion, including the completeness, accuracy, and method of presentation of the Description and assertion; providing the services covered by the Description; selecting the applicable trust services criteria and stating the related controls in the Description; and identifying the risks that threaten the achievement of (a) the Service Organization's service commitments and system requirements; (b) the CCM criteria; and (c) the objectives set forth in C5.

### *Service Auditor's Responsibilities*

Our responsibility is to express an opinion on the Description and on the suitability of the design and operating effectiveness of the controls stated in the Description based on our examination. Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants and International Standard on Assurance Engagements 3000, *Assurance Engagements Other Than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board. Those standards require that we plan and perform our examination to obtain reasonable assurance about whether, in all material respects, the Description is presented in accordance with the description criteria, and the controls stated therein were suitably designed and operating effectively to provide reasonable assurance that (a) the Service Organization's service commitments and system requirements were achieved based on the applicable trust services criteria; (b) the CCM criteria were achieved; and (c) the objectives set forth in C5 were achieved. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

An examination of the description of a service organization's system and the suitability of the design and operating effectiveness of those controls involves the following:

- Obtaining an understanding of the system and the service organization's service commitments and system requirements.
- Assessing the risks that the Description is not presented in accordance with the description criteria and that controls were not suitably designed or did not operate effectively.
- Performing procedures to obtain evidence about whether the Description is presented in accordance with the description criteria.
- Performing procedures to obtain evidence about whether controls stated in the Description were suitably designed to provide reasonable assurance that (a) the service organization achieved its service commitments and system requirements based on the applicable trust services criteria; (b) the CCM criteria were achieved; and (c) the objectives set forth in C5 were achieved.
- Testing the operating effectiveness of those controls stated in the Description to provide reasonable assurance that (a) the service organization achieved its service commitments and system requirements based on the applicable trust services criteria; (b) the CCM criteria were achieved; and (c) the objectives set forth in C5 were achieved.
- Evaluating the overall presentation of the Description.

Our examination also included performing such other procedures as we considered necessary in the circumstances.

### *Service Auditor's Independence and Quality Control*

We have complied with the independence and other ethical requirements of the *Code of Professional Conduct* established by the AICPA. We applied the statements on quality control standards established by the AICPA and, accordingly, maintain a comprehensive system of quality control.

### *Inherent Limitations*

The Description is prepared to meet the common needs of a broad range of report users and may not, therefore, include every aspect of the system that individual users may consider important to meet their informational needs. There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls.

Because of their nature, controls may not always operate effectively to provide reasonable assurance that (a) the Service Organization's service commitments and system requirements are achieved based on the applicable trust services criteria; (b) the CCM criteria are achieved; and (c) the objectives set forth in C5 are achieved. Also, the projection to the future of any conclusions about the suitability of the design or operating effectiveness of the controls is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

### *Description of Tests of Controls*

The specific controls we tested, and the nature, timing, and results of our tests are listed in Section IV of this report.

### *Opinion*

In our opinion, in all material respects,

a. The Description presents Microsoft's system related to in-scope services and offerings, for Azure and Azure Government cloud environments, that was designed and implemented throughout the period April 1, 2021 to March 31, 2022, in accordance with the description criteria.

b. The controls stated in the Description were suitably designed throughout the period April 1, 2021 to March 31, 2022, to provide reasonable assurance that (a) Microsoft's service commitments and systems requirements would be achieved based on the applicable trust services criteria; (b) the CCM criteria would be achieved; and (c) the objectives set forth in C5 would be achieved, if the controls operated effectively throughout that period.

c. The controls stated in the Description operated effectively throughout the period April 1, 2021 to March 31, 2022, to provide reasonable assurance that (a) Microsoft's service commitments and system requirements were achieved based on the applicable trust services criteria; (b) the CCM criteria were achieved; and (c) the objectives set forth in C5 were achieved.

### *Restricted Use*

This report, including the description of tests of controls and results thereof in Section IV, is intended solely for the information and use of Microsoft, user entities of the system of Microsoft related to in-scope services and offerings for Azure and Azure Government cloud environments during some or all of the period April 1, 2021 to March 31, 2022, business partners of Microsoft subject to risks arising from interactions with Microsoft's system, practitioners providing services to such user entities and business partners, prospective user entities and business partners, and regulators who have sufficient knowledge and understanding of the following:

- The nature of the service provided by the Service Organization.
- How the Service Organization's system interacts with user entities, business partners, subservice organizations, and other parties.
- Internal control and its limitations.
- User entity responsibilities and how they may affect the user entity's ability to effectively use the Service Organization's services.
- The applicable trust services criteria, the CCM criteria and the objectives set forth in C5.
- The risks that may threaten the achievement of the Service Organization's service commitments and system requirements and how controls address those risks.

This report is not intended to be, and should not be, used by anyone other than these specified parties.

Deloitte & Touche LLP

May 6, 2022

# Section II:
# Management's Assertion

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Microsoft

# Section II: Management's Assertion

## Microsoft Azure's Management Assertion

We have prepared the description of the system in Section III of Microsoft Corporation (the "Service Organization" or "Microsoft") throughout the period April 1, 2021 to March 31, 2022[3] (the "period") related to in-scope services and offerings for Microsoft Azure, Microsoft Dynamics 365, and Microsoft datacenters ("Azure") for the Azure and Azure Government cloud environments (the "Description"), based on criteria for a description of a service organization's system in DC Section 200, 2018 *Description Criteria for a Description of a Service Organization's System in a SOC 2® Report* ("description criteria"). The Description is intended to provide users with information about our system that may be useful when assessing the risks arising from interactions with Microsoft's system, particularly information about system controls that Microsoft has designed, implemented, and operated to provide reasonable assurance that (a) its service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality ("applicable trust services criteria")[4] set forth in TSP Section 100, 2017 *Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy*; (b) the criteria set forth in the Cloud Security Alliance's (CSA) Cloud Controls Matrix (CCM) Version 3.0.1 control specifications ("CCM criteria") were achieved; and (c) the objectives set forth in the Bundesamt für Sicherheit in der Informationstechnik (BSI) Cloud Computing Compliance Criteria Catalogue ("C5") version published in January 2020 were achieved.

We confirm, to the best of our knowledge and belief, that:

a. The Description presents Microsoft's system that was designed and implemented throughout the period April 1, 2021 to March 31, 2022 in accordance with the description criteria.

b. The controls stated in the Description were suitably designed throughout the period April 1, 2021 to March 31, 2022, to provide reasonable assurance that (a) Microsoft's service commitments and system requirements would be achieved based on the applicable trust services criteria; (b) the CCM criteria would be achieved; and (c) the objectives set forth in C5 would be achieved, if its controls operated effectively throughout that period.

c. The controls stated in the Description operated effectively throughout the period April 1, 2021 to March 31, 2022, to provide reasonable assurance that (a) Microsoft's service commitments and system requirements were achieved based on the applicable trust services criteria; (b) the CCM criteria were achieved; and (c) the objectives set forth in C5 were achieved.

[3] In-scope services and offerings and coverage periods are defined in the *Azure and Azure Government Report Scope Boundary* and *Internal Supporting Services* subsections in Section III of this SOC 2 report. Applicability of the Processing Integrity Trust Services Criteria is defined in the *Azure and Azure Government Report Scope Boundary* subsection in Section III of this SOC 2 report. In-scope datacenters, edge sites, and coverage periods are defined in the *Regions Covered by this Report* subsection in Section III of this SOC 2 report.

[4] Applicable trust services criteria for Microsoft datacenters are Security and Availability.

# Section III:
# Description of Microsoft Azure System

# Section III: Description of Microsoft Azure System

## Overview of Operations

### *Business Description*

### *Azure*

Microsoft Azure is a cloud computing platform for building, deploying and managing applications through a global network of Microsoft and third-party managed datacenters. It supports both Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) cloud service models and enables hybrid solutions that integrate cloud services with customers' on-premises resources. Microsoft Azure supports many customers, partners, and government organizations that span across a broad range of products and services, geographies, and industries. Microsoft Azure is designed to meet their security, confidentiality, and compliance requirements.

Microsoft datacenters support Microsoft Azure, Microsoft Dynamics 365, and Microsoft Online Services ("Online Services"). Online Services such as Intune, Power BI, and others are Software as a Service (SaaS) services that leverage the underlying Microsoft Azure platform and datacenter infrastructure. See section titled 'Azure and Azure Government Report Scope Boundary' for the Microsoft Azure services and offerings and Online Services that are in scope for this report.

### *Dynamics 365*

Dynamics 365 is an online business application suite that integrates the Customer Relationship Management (CRM) capabilities and its extensions with the Enterprise Resource Planning (ERP) capabilities. These end-to-end business applications help customers turn relationships into revenue, earn customers, and accelerate business growth.

"Azure", when referenced in this report, comprises of "Microsoft Azure", "Microsoft Dynamics 365", "Online Services", and the supporting datacenters listed in this report.

### *Applicability of Report*

This report has been prepared to provide information on internal controls of Microsoft that may be relevant to customers pursuing the security, availability, processing integrity, and confidentiality trust services criteria. Microsoft has considered the service-specific characteristics and commitments to determine applicability of the SOC 2 Trust Services Criteria for the in-scope services. Based on the guidance from AICPA, the following are the applicability considerations:

| Trust Services Criteria | Description | Applicability Considerations |
|---|---|---|
| Security | Addresses risks related to potential abuse, theft, misuse and improper access to system components | Applies to the underlying physical and virtual infrastructure of the Azure services and offerings |
| Availability | Addresses risks related to system accessibility for processing, monitoring and maintenance | Applies to the Azure services and offerings whose accessibility is advertised or committed by contract |

| Trust Services Criteria | Description | Applicability Considerations |
|---|---|---|
| Processing Integrity | Addresses risks related to completeness, accuracy, and timeliness of system / application processing of transactions | Applies to the Azure services and offerings that operate transaction processing interfaces |
| Confidentiality | Addresses risks related to unauthorized access or disclosure of specific information designated as "confidential" within contractual arrangements | Applies to the customer data elements that are designated as "confidential" based on Azure's data classification policy |
| Privacy | Addresses risks related to protection and management of personal information | Privacy of end-users and any privacy-related data associated with applications or services developed on the Azure platform is the customer's responsibility as described in Microsoft Trust Center<br><br>Not applicable since personal information of customer administrators is collected and handled within Microsoft Online Customer Portal (MOCP), which is outside the scope of the Azure system boundaries |

As such, the detail herein is limited to operational controls supporting Azure and Online Services as defined in the Azure and Azure Government Report Scope Boundary described below. Azure services and offerings and supported Online Services in scope for this report are defined separately for the following environments: Azure and Azure Government.

### *Azure and Azure Government Report Scope Boundary*

Azure is global multi-tenant cloud platform that provides a public cloud deployment model. Azure Government is a US Government Community Cloud that is physically separated from the Azure cloud. The following Azure and Azure Government services and offerings are in scope for this report:

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| ***Microsoft Datacenters*** | | | | | |
| Microsoft Datacenter and Operations Service | | ✓ | ✓ | ✓ | ✓ |
| ***Azure*** | | | | | |
| Compute | App Service | ✓ | ✓ | ✓ | ✓ |

[5] Examination period scope H1 FY22 extends from April 1, 2021 to September 30, 2021.
Examination period scope H2 FY22 extends from October 1, 2021 to March 31, 2022.

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Azure Arc Enabled Servers | ✓ | ✓ | ✓ | ✓ |
| | Azure Functions | ✓ | ✓ | ✓ | ✓ |
| | Azure Service Fabric | ✓ | ✓ | ✓ | ✓ |
| | Azure VM Image Builder | ✓ | - | ✓ | ✓ |
| | Azure VMware Solution | ✓ | - | ✓ | ✓ |
| | Batch | ✓ | ✓ | ✓ | ✓ |
| | Cloud Services[6] | ✓ | ✓ | ✓ | ✓ |
| | Guest Configuration | ✓ | ✓ | ✓ | ✓ |
| | Planned Maintenance | ✓ | ✓ | ✓ | ✓ |
| | Virtual Machines | ✓ | ✓ | ✓ | ✓ |
| | Virtual Machine Scale Sets | ✓ | ✓ | ✓ | ✓ |
| | Azure Virtual Desktop | ✓ | ✓ | ✓ | ✓ |
| Containers | Azure Arc Enabled Kubernetes | ✓ | ✓ | ✓ | ✓ |
| | Azure Kubernetes Configuration Management | ✓ | ✓ | ✓ | ✓ |
| | Azure Kubernetes Service (AKS) | ✓ | ✓ | ✓ | ✓ |
| | Azure Red Hat OpenShift | ✓ | - | ✓ | ✓ |
| | Container Instances | ✓ | ✓ | ✓ | ✓ |
| | Container Registry | ✓ | ✓ | ✓ | ✓ |
| Networking | Application Gateway | ✓ | ✓ | ✓ | ✓ |
| | Azure Bastion | ✓ | ✓ | ✓ | ✓ |
| | Azure DDoS Protection | ✓ | ✓ | ✓ | ✓ |

[6] Offerings for which AICPA Processing Integrity trust service criteria were examined: Cloud Services, Azure Resource Manager (ARM), Microsoft Azure Portal and Azure Service Manager (RDFE).

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Azure DNS | ✓ | ✓ | ✓ | ✓ |
| | Azure ExpressRoute | ✓ | ✓ | ✓ | ✓ |
| | Azure Firewall | ✓ | ✓ | ✓ | ✓ |
| | Azure Firewall Manager | ✓ | - | ✓ | ✓ |
| | Azure Front Door | ✓ | ✓ | ✓ | ✓ |
| | Azure Internet Analyzer | ✓ | - | ✓ | ✓ |
| | Azure Private Link | ✓ | ✓ | ✓ | ✓ |
| | Azure Public IP | ✓ | ✓ | ✓ | ✓ |
| | Azure Route Server | ✓ | ✓ | - | ✓ |
| | Azure Web Application Firewall | ✓ | ✓ | ✓ | ✓ |
| | Content Delivery Network | ✓ | ✓ | ✓ | ✓ |
| | Load Balancer | ✓ | ✓ | ✓ | ✓ |
| | Microsoft Azure Peering Service | ✓ | ✓ | ✓ | ✓ |
| | Network Watcher | ✓ | ✓ | ✓ | ✓ |
| | Traffic Manager | ✓ | ✓ | ✓ | ✓ |
| | Virtual Network | ✓ | ✓ | ✓ | ✓ |
| | Virtual Network NAT | ✓ | ✓ | ✓ | ✓ |
| | VPN Gateway | ✓ | ✓ | ✓ | ✓ |
| | Virtual WAN | ✓ | ✓ | ✓ | ✓ |
| Storage | Azure Archive Storage | ✓ | ✓ | ✓ | ✓ |
| | Azure Backup | ✓ | ✓ | ✓ | ✓ |
| | Azure Data Box | ✓ | ✓ | ✓ | ✓ |
| | Azure Data Lake Storage Gen1 | ✓ | - | ✓ | ✓ |
| | Azure File Sync | ✓ | ✓ | ✓ | ✓ |
| | Azure HPC Cache | ✓ | ✓ | ✓ | ✓ |

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Azure Import/Export | ✓ | ✓ | ✓ | ✓ |
| | Azure NetApp Files | ✓ | ✓ | ✓ | ✓ |
| | Azure Site Recovery | ✓ | ✓ | ✓ | ✓ |
| | Azure Storage (Blobs (including Azure Data Lake Storage Gen2), Disks, Files, Queues, Tables, Azure Disk Storage) including Cool and Premium | ✓ | ✓ | ✓ | ✓ |
| | StorSimple | ✓ | ✓ | ✓ | ✓ |
| Databases | Azure Health Data Services | ✓ | ✓ | ✓ | ✓ |
| | Azure Cache for Redis | ✓ | ✓ | ✓ | ✓ |
| | Azure Cosmos DB | ✓ | ✓ | ✓ | ✓ |
| | Azure Database for MariaDB | ✓ | ✓ | ✓ | ✓ |
| | Azure Database for MySQL | ✓ | ✓ | ✓ | ✓ |
| | Azure Database for PostgreSQL | ✓ | ✓ | ✓ | ✓ |
| | Azure Database Migration Service | ✓ | ✓ | ✓ | ✓ |
| | Azure SQL | ✓ | ✓ | ✓ | ✓ |
| | Azure Synapse Analytics | ✓ | ✓ | ✓ | ✓ |
| | SQL Server Registry | ✓ | - | ✓ | ✓ |
| | SQL Server Stretch Database | ✓ | ✓ | ✓ | ✓ |
| Developer Tools | Azure App Configuration | ✓ | ✓ | ✓ | ✓ |
| | Azure DevTest Labs | ✓ | ✓ | ✓ | ✓ |
| | Azure for Education | ✓ | - | ✓ | ✓ |
| | Azure Lab Services | ✓ | - | ✓ | ✓ |
| | GitHub AE | ✓ | ✓ | ✓ | ✓ |
| Analytics | Azure Analysis Services | ✓ | ✓ | ✓ | ✓ |

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Azure Data Explorer | ✓ | ✓ | ✓ | ✓ |
| | Azure Data Share | ✓ | ✓ | ✓ | ✓ |
| | Azure Stream Analytics | ✓ | ✓ | ✓ | ✓ |
| | Data Catalog | ✓ | - | ✓ | ✓ |
| | Data Factory | ✓ | ✓ | ✓ | ✓ |
| | Data Lake Analytics | ✓ | - | ✓ | ✓ |
| | HDInsight | ✓ | ✓ | ✓ | ✓ |
| | Power BI Embedded | ✓ | ✓ | ✓ | ✓ |
| AI + Machine Learning | AI Builder[7] | ✓ | ✓ | ✓ | ✓ |
| | Azure Applied AI Services | ✓ | - | ✓ | ✓ |
| | Azure Bot Service | ✓ | ✓ | ✓ | ✓ |
| | Azure Open Datasets | ✓ | - | ✓ | ✓ |
| | Azure Machine Learning | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Anomaly Detector | ✓ | - | ✓ | ✓ |
| | Cognitive Services: Computer Vision | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Content Moderator | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Custom Vision | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Face | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Form Recognizer | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Immersive Reader | ✓ | - | ✓ | ✓ |

[7] Examination period for this offering / service for Azure was from April 1, 2021 to March 31, 2022, while the examination period for Azure Government was from October 1, 2021 to March 31, 2022.

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Cognitive Services: Language Understanding | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Personalizer | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: QnA Maker | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Speech Services | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Text Analytics | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Translator | ✓ | ✓ | ✓ | ✓ |
| | Cognitive Services: Video Indexer | ✓ | ✓ | ✓ | ✓ |
| | Machine Learning Studio (Classic) | ✓ | - | ✓ | ✓ |
| | Microsoft Autonomous Development Platform | ✓ | - | ✓ | ✓ |
| | Microsoft Genomics | ✓ | - | ✓ | ✓ |
| | Azure Health Bot | ✓ | - | ✓ | ✓ |
| Internet of Things | Azure Defender for IoT | ✓ | ✓ | ✓ | ✓ |
| | Azure Digital Twins | ✓ | - | ✓ | ✓ |
| | Azure IoT Central | ✓ | - | ✓ | ✓ |
| | Azure IoT Hub | ✓ | ✓ | ✓ | ✓ |
| | Azure Sphere | ✓ | - | ✓ | ✓ |
| | Azure Time Series Insights | ✓ | - | ✓ | ✓ |
| | Event Grid | ✓ | ✓ | ✓ | ✓ |
| | Event Hubs | ✓ | ✓ | ✓ | ✓ |
| | Microsoft Cloud for Sustainability | ✓ | - | - | ✓ |
| | Notification Hubs | ✓ | ✓ | ✓ | ✓ |
| | Windows 10 IoT Core Services | ✓ | - | ✓ | ✓ |
| Integration | API Management | ✓ | ✓ | ✓ | ✓ |

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Logic Apps | ✓ | ✓ | ✓ | ✓ |
| | Service Bus | ✓ | ✓ | ✓ | ✓ |
| Identity | Azure Active Directory | ✓ | ✓ | ✓ | ✓ |
| | Azure Active Directory B2C | ✓ | - | ✓ | ✓ |
| | Azure Active Directory Domain Services | ✓ | ✓ | ✓ | ✓ |
| | Azure Information Protection | ✓ | ✓ | ✓ | ✓ |
| Management and Governance | Application Change Analysis | ✓ | - | - | ✓ |
| | Automation | ✓ | ✓ | ✓ | ✓ |
| | Azure Advisor | ✓ | ✓ | ✓ | ✓ |
| | Azure Blueprints[7] | ✓ | ✓ | ✓ | ✓ |
| | Azure Lighthouse | ✓ | ✓ | ✓ | ✓ |
| | Azure Managed Applications | ✓ | ✓ | ✓ | ✓ |
| | Azure Migrate | ✓ | ✓ | ✓ | ✓ |
| | Azure Monitor | ✓ | ✓ | ✓ | ✓ |
| | Azure Policy | ✓ | ✓ | ✓ | ✓ |
| | Azure Purview | ✓ | - | ✓ | ✓ |
| | Azure Resource Graph | ✓ | ✓ | ✓ | ✓ |
| | Azure Resource Manager (ARM)[6] | ✓ | ✓ | ✓ | ✓ |
| | Azure Signup Portal | ✓ | ✓ | ✓ | ✓ |
| | Cost Management | ✓ | ✓ | ✓ | ✓ |
| | Cloud Shell | ✓ | ✓ | ✓ | ✓ |
| | Microsoft Azure Portal[6] | ✓ | ✓ | ✓ | ✓ |
| | Quota+Usage Blade | ✓ | ✓ | - | ✓ |
| | Scheduler | ✓ | ✓ | ✓ | ✓ |
| Security | Trusted Hardware Identity Management | ✓ | - | ✓ | ✓ |

| Product Category | Offering / Service | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|---|
| | | Azure | Azure Government | H1 FY22 | H2 FY22 |
| | Azure Dedicated HSM | ✓ | ✓ | ✓ | ✓ |
| | Azure Security Center | ✓ | ✓ | ✓ | ✓ |
| | Azure Sentinel | ✓ | ✓ | ✓ | ✓ |
| | Customer Lockbox for Microsoft Azure | ✓ | ✓ | ✓ | ✓ |
| | Key Vault | ✓ | ✓ | ✓ | ✓ |
| | Microsoft Azure Attestation | ✓ | - | ✓ | ✓ |
| | Multi-Factor Authentication | ✓ | ✓ | ✓ | ✓ |
| Media | Azure Media Services | ✓ | ✓ | ✓ | ✓ |
| Web | Azure Cognitive Search | ✓ | ✓ | ✓ | ✓ |
| | Azure Maps | ✓ | ✓ | ✓ | ✓ |
| | Azure SignalR Service | ✓ | ✓ | ✓ | ✓ |
| | Azure Spring Cloud Service | ✓ | - | ✓ | ✓ |
| | Azure Web Pubsub | ✓ | ✓ | - | ✓ |
| Mixed Reality | Azure Remote Rendering | ✓ | - | ✓ | ✓ |
| | Azure Spatial Anchors | ✓ | - | ✓ | ✓ |
| Internal Supporting Services[6,8] | | ✓ | ✓ | ✓ | ✓ |

[8] Azure Government scope boundary for internal services: AsimovEventForwarder, AutoPilot Security, Azure Security Monitoring (ASM SLAM), AzCP Platform, Azure Networking, Azure Service Health, Azure Stack Bridge, Azure Stack Edge Service, Azure System Lockdown, Azure Watson, Cognitive Services: Container Platform, Fabric Controller Fundamental Services, CoreWAN, D365 Integrator App, dSCM, dSMS, dSTS, Gateway Manager, Geneva Actions, Geneva Analytics Orchestration, Geneva Warm Path, Hybrid Identity Service, Interflow, JIT, MEE Privacy Service, MDM, Microsoft Email Orchestrator, MSFT.RR DNS, Network Billing, OneBranch Release, OneDeploy Deployment Infrastructure (DE), OneDS Collector, OneIdentity, PF-FC, PilotFish, Unified Remote Scanning (URSA), Vulnerability Scanning & Analytics, WaNetMon, Windows Azure Jumpbox, and Workflow. The coverage period for internal services for both Azure and Azure Government is April 1, 2021 through March 31, 2022 except for those specified with shorter coverage periods in the Internal Supporting Services subsection herein.

| Offering | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|
| | Azure | Azure Government | H1 FY22 | H2 FY22 |
| ***Microsoft Online Services*** | | | | |
| Appsource | ✓ | - | ✓ | ✓ |
| Intelligent Recommendations | ✓ | - | ✓ | ✓ |
| Microsoft 365 Defender | ✓ | ✓ | ✓ | ✓ |
| Microsoft Defender for Cloud Apps | ✓ | ✓ | ✓ | ✓ |
| Microsoft Defender for Endpoint | ✓ | ✓ | ✓ | ✓ |
| Microsoft Defender for Identity | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Customer Voice | ✓ | - | ✓ | ✓ |
| Microsoft Graph | ✓ | ✓ | ✓ | ✓ |
| Microsoft Intune | ✓ | ✓ | ✓ | ✓ |
| Microsoft Managed Desktop | ✓ | - | ✓ | ✓ |
| Microsoft Stream | ✓ | ✓ | ✓ | ✓ |
| Microsoft Threat Experts | ✓ | - | ✓ | ✓ |
| Nomination Portal[9] | ✓ | ✓ | ✓ | ✓ |
| Power Apps | ✓ | ✓ | ✓ | ✓ |
| Power Automate | ✓ | ✓ | ✓ | ✓ |
| Power BI | ✓ | ✓ | ✓ | ✓ |
| Power Virtual Agents | ✓ | ✓ | ✓ | ✓ |
| Update Compliance | ✓ | - | ✓ | ✓ |

[9] Examination period for this offering / service for Azure was from April 1, 2021 to March 31, 2022, while the examination period for Azure Government was from April 1, 2021 to September 30, 2021.

| Offering | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|
| | Azure | Azure Government | H1 FY22 | H2 FY22 |
| ***Microsoft Dynamics 365*** | | | | |
| Chat for Dynamics 365 | ✓ | ✓ | ✓ | ✓ |
| Dataverse | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 AI Customer Insights | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Athena - CDS to Azure Data Lake | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Business Central | ✓ | - | ✓ | ✓ |
| Dynamics 365 Business Q&A | ✓ | - | ✓ | ✓ |
| Dynamics 365 Commerce | ✓ | - | ✓ | ✓ |
| Dynamics 365 Customer Insights Engagement Insights | ✓ | - | ✓ | ✓ |
| Dynamics 365 Customer Service | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Customer Service Insights | ✓ | - | ✓ | - |
| Dynamics 365 Field Service | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Finance | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Fraud Protection | ✓ | - | ✓ | ✓ |
| Dynamics 365 Guides | ✓ | - | ✓ | ✓ |
| Dynamics 365 Human Resources | ✓ | - | ✓ | ✓ |
| Dynamics 365 Marketing | ✓ | - | ✓ | ✓ |
| Dynamics 365 Intelligent Order Management | ✓ | - | ✓ | ✓ |
| Power Apps portals | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Project Operations | ✓ | - | ✓ | ✓ |
| Dynamics 365 Remote Assist | ✓ | - | ✓ | ✓ |
| Dynamics 365 Retail | ✓ | - | ✓ | ✓ |
| Dynamics 365 Sales | ✓ | ✓ | ✓ | ✓ |
| Dynamics 365 Sales Insights | ✓ | - | ✓ | ✓ |
| Dynamics 365 Sales Professional | ✓ | - | ✓ | ✓ |
| Dynamics 365 Supply Chain Management | ✓ | - | ✓ | ✓ |

| Offering | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|
| | Azure | Azure Government | H1 FY22 | H2 FY22 |
| Dynamics 365 Talent Attract & Onboard | ✓ | - | ✓ | ✓ |

| Offering | Cloud Environment Scope | | Examination Period Scope[5] | |
|---|---|---|---|---|
| | Azure | Azure Government | H1 FY22 | H2 FY21 |
| ***Microsoft Cloud for Financial Services*** | | | | |
| Unified Customer Profile | ✓ | - | ✓ | ✓ |
| Collaboration Manager | ✓ | - | ✓ | ✓ |
| Customer Onboarding | ✓ | - | ✓ | ✓ |

### *Regions Covered by this Report*

Azure production infrastructure is located in globally distributed datacenters. These datacenters across multiple regions deliver the core physical infrastructure that includes physical hardware asset management, security, data protection, networking services. These datacenters are managed, monitored, and operated by Microsoft operations staff delivering online services with 24x7 continuity. The purpose-built facilities are part of a network of datacenters that provide mission critical services to Azure and other Online Services. The datacenters in scope for the purposes of this report are:

**Azure Regions**

**Americas**

- West US
- West US 2
- West US 3
- West Central US
- Central US
- USGOV Iowa
- North Central US
- USGOV Arizona
- South Central US
- USGOV Texas
- East US
- East US 2
- USGOV Virginia
- USGOV Wyoming
- Canada East
- Canada Central
- Brazil South
- Brazil Southeast

**EMEA**

- West Europe
- North Europe
- UK South
- UK West
- France Central
- France South
- Germany North
- Germany West Central
- Germany Central
- Switzerland West
- Switzerland North
- Norway East
- Norway West
- Sweden Central
- South Africa North
- South Africa West
- UAE Central
- UAE North

**APAC**

- Australia East
- Australia Southeast
- Australia Central
- Australia Central 2
- West India
- Central India
- Jio India West
- Jio India Central
- South India
- East Asia
- Japan West
- Japan East
- Southeast Asia
- Korea South
- Korea Central

In addition to the datacenters included in the Azure regions listed above, there are datacenters outside of those regions which are included in the scope of the examination and are supporting Office 365 services. Note that the Office 365 services are not included in the scope of the examination.

## Edge Sites

- Ashburn, VA (ASH)
- Athens, Greece (ATH01)
- Atlanta, GA (ATA)
- Auckland, New Zealand (AKL30)
- Bangkok, Thailand (BKK30)
- Barcelona, Spain (BCN30)
- Barueri, Brazil (GRU30[10])
- Berlin, Germany (BER30)
- Bogota, Colombia (BOG30)
- Boston, MA (BOS31)
- Brisbane, Australia (BNE01)
- Brussels, Belgium (BRU30)
- Bucharest, Romania (BUH01)
- Budapest, Hungary (BUD01)
- Buenos Aires, Argentina (BUE30)
- Busan, South Korea (PUS03)
- Cairo, Egypt (CAI30)
- Cape Town, South Africa (CPT02)
- Chicago, IL (CHG,CHI30[10])
- Copenhagen, Denmark (CPH30)
- Dallas, TX (DAL, DFW30)
- Denver, CO (DNA)
- Detroit, MI (DTT30[11])
- Dubai, United Arab Emirates (DXB30)
- Dusseldorf, Germany (DUS30)
- Frankfurt, Germany (FRA/31)
- Geneva, Switzerland (GVA30)
- Helsinki, Finland (HEL03)
- Ho Chi Minh City, Vietnam (SGN30)
- Hong Kong (HKB, HKG30)
- Honolulu, HI (HNL01)
- Houston, TX (HOU01)
- Hyderabad, India (HYD30)
- Istanbul, Turkey (IST30)
- Jakarta, Indonesia (JKT30)
- Jacksonville, FL (JAX30)
- Johannesburg, South Africa (JNB02)
- Kiev, Ukraine (IEV30)
- Kuala Lumpur, Malaysia (KUL02/30)
- Las Vegas, NV (LAS01/30)
- Luanda, Angola (LAD30[10])
- Lisbon, Portugal (LIS01)
- London, United Kingdom (LON04/LTS)
- Los Angeles, CA (LAX)
- Lagos, Nigeria (LOS30)
- Madrid, Spain (MAD30)
- Manchester, United Kingdom (MAN30)
- Manila, Philippines (MNL30)
- Memphis, TN (MEM30[10])
- Miami, FL (MIA)
- Milan, Italy (MIL30)
- Minneapolis, MN (MSP30)
- Montreal, Canada (YMQ01)
- Moscow, Russia (MOW30)
- Mumbai, India (BOM02)
- Munich, Germany (MUC30)
- Nairobi, Kenya (NBO30)
- Nashville, TN (BNA30)
- New Delhi, India (DEL01)
- New York City, NY (NYC)
- Newark, NJ (EWR30)
- Osaka, Japan (OSA30/31)
- Oslo, Norway (OSL30)
- Palo Alto, CA (PAO)
- Paris, France (PAR02/PRA)
- Perth, Australia (PER01/30)
- Philadelphia, PA (PHL30)
- Phoenix, AZ (PHX31)
- Portland, OR (PDX31)
- Prague, Czech Republic (PRG01)
- Queretaro, Mexico (MEX30/31[10])
- Rabat, Morocco (RBA30)
- Rio de Janeiro (RIO02/03)
- Rome, Italy (ROM30)
- Sao Paulo, Brazil (SAO03[11]/31[10])
- Salt Lake City, UT (SLC31)
- San Diego, CA (SAN30)
- San Jose, CA (SJC)
- Santiago, Chile (SCL30)
- Seattle, WA (WST, STB)
- Seoul, South Korea (SLA)
- Singapore (SGE, SIN30, SG1[11])
- Sofia, Bulgaria (SOF01)
- Stockholm, Sweden (STO)
- Taipei, Taiwan (TPE30/31)
- Tampa, FL (TPA30[10])
- Tel Aviv, Israel (TLV30)
- Tokyo, Japan (TYA/TYB)
- Toronto, Canada (YTO01/30[10])
- Vancouver, Canada (YVR30)
- Warsaw, Poland (WAW01)
- Zagreb, Croatia (ZAG30)
- Zurich, Switzerland (ZRH)

[10] Examination period for this edge site was from October 1, 2021 to March 31, 2022.

[11] Examination period for this edge site was from April 1, 2021 to September 30, 2021.

In addition to datacenter, network, and personnel security practices, Azure also incorporates security practices at the application and platform layers to enhance security for application development and service administration.

### *Principal Service Commitments and System Requirements*

Microsoft makes service commitments to its customers and has established system requirements as part of the Azure service. Some of these commitments are principal to the performance of the service and relate to applicable trust services criteria. Microsoft is responsible for its service commitments and system requirements and for designing, implementing, and operating effective controls within the system to provide reasonable assurance that Microsoft's service commitments and system requirements are achieved.

Service commitments to customers are documented and communicated in the Microsoft Online Subscription Agreement, Microsoft Enterprise Enrollment Agreement (Volume Licensing - Online Services Terms), Microsoft Azure Privacy Statement, and Microsoft Trust Center, as well as in the description of the service offering provided online. Service commitments include, but are not limited to, the following:

- Security: Microsoft has made commitments related to securing customer data and complying with relevant laws and regulations. These commitments are addressed through measures including data encryption, authentication mechanisms, physical security and other relevant security controls.

- Availability: Microsoft has made commitments related to percentage uptime and connectivity for Azure as well as commitments related to service credits for instances of downtime.

- Processing Integrity: Microsoft has made commitments related to processing customer actions completely, accurately and timely. These customer actions include, for example, specifying geographic regions for the storage and processing of customer data.

- Confidentiality: Microsoft has made commitments related to maintaining the confidentiality of customers' data through data classification policies, data encryption and other relevant security controls.

Microsoft has established operational requirements that support the achievement of service commitments, relevant laws and regulations, and other system requirements. Such requirements are communicated in Azure's system policies and procedures, system design documentation, and contracts with customers. Information security policies define an organization-wide approach to how systems and data are protected. These include policies around how the service is designed and developed, how the system is operated, how the internal business systems and networks are managed and how employees are hired and trained. In addition to these policies, standard operating procedures have been documented on how to carry out specific manual and automated processes required in the operation and development of various Azure services and offerings. Microsoft's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality.

## Control Environment

### *Integrity and Ethical Values*

Corporate governance at Microsoft starts with an independent Board of Directors that establishes, maintains, and monitors standards and policies for ethics, business practices, and compliance that span across the company. Corporate governance at Microsoft serves several purposes:

1. To establish and preserve management accountability to Microsoft's owners by appropriately distributing rights and responsibilities among Microsoft Board members, managers, and shareholders
2. To provide a structure through which management and the Board set and attain objectives and monitor performance

3. To strengthen and safeguard a culture of business integrity and responsible business practices
4. To encourage efficient use of resources and to require accountability for stewardship of these resources

Further information about Microsoft's general corporate governance is available on the Microsoft public website.

### *Microsoft Standards of Business Conduct*

The Microsoft Standards of Business Conduct (SBC) reflect a commitment to ethical business practices and regulatory compliance. They summarize the principles and policies that guide Microsoft's business activities and provide information about Microsoft's Business Conduct and Compliance Program. SBC was developed in full consideration of Sarbanes-Oxley Act (SOX) and proposed NASDAQ listing requirements related to codes of conduct. Additional information about Microsoft's SBC is available on the Microsoft public website.

### *Training*

Annual SBC training is mandatory for all Microsoft employees and contingent staff. The SBC training includes information about Microsoft corporate policies for conducting business while conforming to applicable laws and regulations. It reinforces the need for employees to work with integrity and to comply with the laws of the countries in which Microsoft operates. It also guides employees and contingent staff on the processes and channels available to report possible violations or to ask questions. Microsoft also trains its outsourced providers to understand and comply with Microsoft's supplier code of conduct.

### *Accountability*

All Microsoft and contingent staff are accountable for understanding and adhering to the guidance contained in the Microsoft Security Policy, and any applicable supporting procedures. Individuals not employed by Microsoft, but allowed to access, manage, or process information assets of the Azure environment and datacenters are also accountable for understanding and adhering to the guidance contained in the Security Policy and standards.

### *Commitment to Competence*

Microsoft hiring managers define job requirements prior to recruiting, interviewing, and hiring. Job requirements include the primary responsibilities and tasks involved in the job, background skills needed to perform the job, and personal qualifications desired. Once the requirements are determined, managers create a job description, which is a profile of the job, and is used to identify potential candidates. When viable candidates are identified, the interview process begins to evaluate candidates and make an appropriate hiring decision.

Microsoft employees create individual Core Priorities that align with those of their manager, organization, and Microsoft, and are supported with customer-centric actions and measures so that everyone is working toward the same overarching vision. These Core Priorities are established when an employee is hired, and then updated during one-on-one Connect meetings with their manager. The primary focus of the Connect meetings is to assess employee performance against their priorities and to agree on an updated list of priorities going forward.

Microsoft's Compensation Committee is responsible for reviewing and discussing plans for executive officer development and corporate succession plans for the CEO and other executive officers.

### *Internal Communication*

Responsibilities around internal controls are communicated broadly through Monthly Controller calls, All Hands Meetings run by the Chief Financial Officer (CFO), and email updates sent / conference calls held by the Financial Compliance Group with the Sarbanes-Oxley extended project team. Responsibilities for compliance with policies are outlined in the SBC training.

### *Compliance & Ethics - Board of Directors and Senior Leadership*

Compliance & Ethics designs and provides reports to the Board of Directors on compliance matters. They also organize annual meetings with the Senior Leadership Team (SLT) for their compliance review.

### *Internal Audit Department*

Microsoft has an Internal Audit (IA) function that reports directly to the Audit Committee (AC) of the Board of Directors, which is constituted solely of independent directors. IA has a formal charter that is reviewed by the AC and management. Responsibilities of IA include performing audits and reporting issues and recommendations to management and the AC.

### *Audit Committee*

The AC charter and responsibilities are on Microsoft's website. The AC meets privately on a quarterly basis with Microsoft's external auditors and IA. The agendas for the quarterly AC meetings are found in the AC Responsibilities Calendar sent out with the charter. In addition, the AC influences the company through the IA function. The AC reviews the scope of internal audit and assists in the process of identifying and resolving any issues. Lastly, the AC monitors itself by completing an annual self-evaluation.

## Risk Assessment

### *Practices for Identification of Risk*

The Microsoft Enterprise Risk Management (ERM) team provides management and accountability of Microsoft Corporate's short- and long-term risks. ERM collaborates with Internal Audit, the Financial Compliance Group, Operations, and Legal and Compliance groups to perform a formal risk assessment. These risk assessments include risks in financial reporting, fraud, and compliance with laws.

### *Internal Audit - Fraud Risks*

IA and the Financial Integrity Unit (FIU) are responsible for identifying fraud risks across Microsoft. The FIU performs procedures for the detection, investigation, and prevention of financial fraud impacting Microsoft worldwide. Fraud and abuse that are uncovered are reported to the Disclosure Committee. The FIU provides both a reactive and proactive response to allegations of fraud and abuse. The FIU uses a case management system that is also used by the Director of Compliance to track cases and related metrics. The FIU interacts with Microsoft management, Corporate, External, and Legal Affairs (CELA), Human Resource (HR), Finance, Procurement, and others to determine specific fraud risks and responses.

### *Periodic Risk Assessment*

IA and other groups within the company perform a periodic risk assessment. The assessment is reviewed by senior management.

IA specialization area leaders determine high-priority risks across the company, including risks related to financial reporting, operational business process, and systems controls. Control failures are also assessed to determine whether they give rise to additional risks.

### *Compliance & Ethics / Internal Audit / Risk Management - Risk Responsibility*

The responsibility for risk is distributed throughout the organization based on the individual group's services. Compliance & Ethics, IA, and the ERM team work together to represent enterprise risk management. Through quarter and year-end reviews, the CFO, and Corporate Controller (and respective groups) review the disclosures and issues that may have arisen.

## Monitoring

### *Security and Compliance Monitoring*

Azure and the datacenters maintain reasonable and appropriate technical and organizational measures, internal controls, and information security routines intended to help protect customer data against accidental loss, destruction, or alteration; unauthorized disclosure or access; or unlawful destruction.

### *Compliance & Ethics - Business Conduct Hotline*

There is a confidential and anonymous Business Conduct Hotline available for employees to report issues. The hotline is accessible 24x7 through email, phone, fax, and mail. The individual may also send a letter or fax reporting the concern to Microsoft's Compliance & Ethics - Business & Regulatory Investigations team.

Employees are instructed that it is their duty to promptly report any concerns of suspected or known violations of the Code of Professional Conduct, the SBC, or other Microsoft policies or guidelines. The procedures to be followed for such a report are outlined in the SBC and the Whistle Blowing Reporting Procedure and Guidelines in the Employee Handbook. Employees are also encouraged to communicate the issue to their manager, their manager's manager, their CELA contact, their HR contact, or the Compliance Office.

### *Internal Audit*

Microsoft's IA department provides support to management across the company by independently and objectively assessing whether the objectives of management are adequately performed, and by facilitating process improvements, and the adoption of business practices, policies, and controls governing worldwide operations.

## Information and Communication

An annual process exists to set objectives and commitments among all executives and is rolled down to employees. These commitments and objectives are filtered down to team members through the annual and midyear review process.

### *Office of the CFO - Communications External to the Company*

CFO communications outside the company occur throughout the year and, where appropriate, these external communications include a discussion of the company's attitude toward sound internal controls. The Office of the CFO is responsible for a number of communications outside the company, including Quarterly Earnings Release, Financial Analyst meetings, customer visits, external conferences, and external publications.

## Data

Customers upload data for storage or processing within the services or applications that are hosted on the cloud services platform. In addition, certain types of data are provided by the customers or generated on the customer's behalf to enable the usage of the cloud services. Microsoft only uses customer data in order to support the provisioning of the services subscribed to by the customers in accordance with the Service Level Agreements (SLAs). The customer provided data are broadly classified into the following data types:

1. **Access Control Data** is data used to manage access to administrative roles or sensitive functions.

2. **Customer Content** is the data, information and code that Microsoft internal employees, and non-Microsoft personnel (if present) provide to, transfer in, store in or process in a Microsoft Online Service or product.

3. **End User Identifiable Information (EUII)** is data that directly identifies or could be used to identify the authenticated user of a Microsoft service. EUII does not extend to other personal information found in Customer Content.

4. **Support Data** is data provided to Microsoft and generated by Microsoft as part of support activities.

5. **Feedback** is data provided as part of a review or feedback for one of Microsoft's products and services that includes personal data.

6. **Account Data** is information about payment instruments. This type of data is not stored in the Azure platform.

7. **Public Personal Data** is publicly available personal information that Microsoft obtains from external sources.

8. **End User Pseudonymous Identifiers (EUPI)** are identifiers created by Microsoft, tied to the user of a Microsoft service.

9. **Organization Identifiable Information (OII)** is data that can be used to identify a particular tenant / Azure subscription / deployment / organization (generally configuration or usage data) and is not linkable to a user.

10. **System Metadata** is data generated in the course of running the service, not linkable to a user or tenant. It does not contain Access Control Data, Customer Content, EUII, Support Data, Account Data, Public Personal Data, EUPI, or OII.

11. **Public Non-Personal Data** is publicly available information that Microsoft obtains from external sources. It does not contain Public Personal Data.

### *Data Ownership*

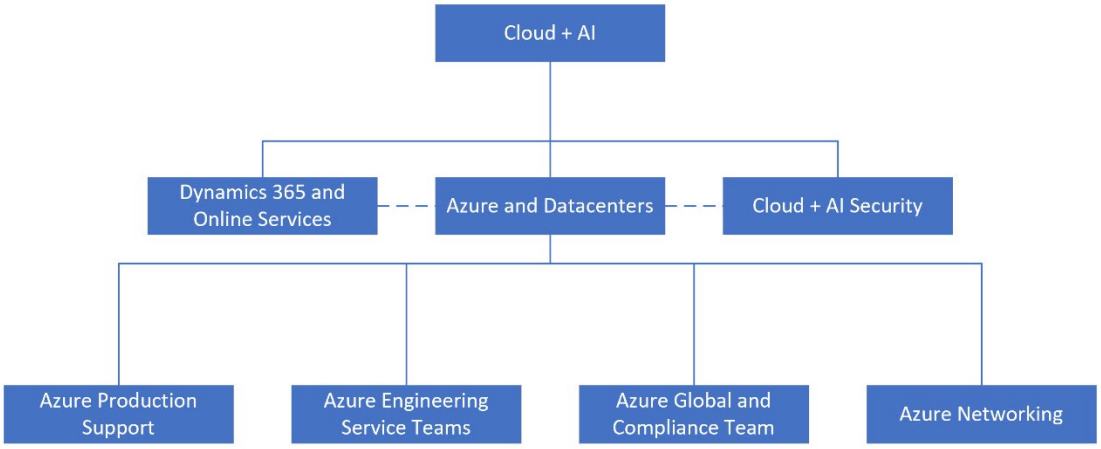
Microsoft does not inspect, approve, or monitor applications that customers deploy to Azure. Moreover, Microsoft does not know what kind of data customers choose to store in Azure. Microsoft does not claim data ownership over the customer information entered into Azure. Azure's Agreement states, "Customers are solely responsible for the content of all Customer Data. Customers will secure and maintain all rights in Customer Data necessary for Azure to provide the Online Services to them without violating the rights of any third party or otherwise obligating Microsoft to them or to any third party. Microsoft does not and will not assume any obligations with respect to Customer Data or to their use of the Product other than as expressly set forth in the Agreement or as required by applicable law."

### *Applicable Data Elements*

For the purposes of this report, Microsoft has implemented controls to protect the data elements specifically covered under Customer Content and Access Control Data.

## People

Azure is comprised and supported by the following groups who are responsible for the delivery and management of Azure services:




### *Online Services*

Online Services teams manage the service lifecycle of the finished SaaS services that leverage the underlying Azure platform and datacenter infrastructure. They are responsible for the development of new features, operational support, and escalations.

### *Cloud + AI Security*

The Cloud + AI Security team works to make Azure a secure and compliant cloud platform by building common security technologies, tools, processes, and best practices. The Cloud + AI Security team is involved in the review of deployments and enhancements of Azure services to facilitate security considerations at every level of the Security Development Lifecycle (SDL). They also perform security reviews and provide security guidance for the datacenters. This team consists of personnel responsible for:

- Security Development Lifecycle
- Security incident response
- Driving security functionality within service development work

### *Azure Production Support*

The Azure Production Support team is responsible for build-out, deployment and management of Azure services. This team consists of the following:

- **Azure Live Site** - Monitors and supports the Azure platform; proactively addresses potential platform issues; and reacts to incidents and support requests
- **Azure Deployment Engineering** - Builds out new capacity for the Azure platform; and deploys platform and product releases through the release pipeline
- **Azure Customer Support** - Provides support to individual customers and multinational enterprises from basic break-fix support to rapid response support for mission critical applications

### *Azure Engineering Service Teams*

The Azure Engineering Service teams manage the service lifecycle. Their responsibilities include:

- Development of new services
- Serving as an escalation point for support

- Providing operational support for existing services (DevOps model)

The team includes personnel from the Development, Test and Program Management (PM) disciplines for design, development, and testing of services, and providing technical support as needed.

### *Global Ecosystem and Compliance Team*

The Global Ecosystem and Compliance team is responsible for developing, maintaining and monitoring the Information Security (IS) program including the ongoing risk assessment process.

As part of managing compliance adherence, the team drives related features within the Azure product families. This team consists of personnel responsible for:

- Training
- Privacy
- Risk assessment
- Internal and external audit coordination

### *Networking*

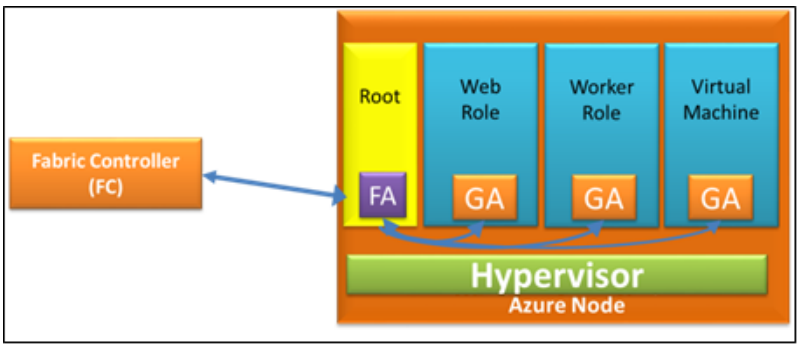
The Networking team is responsible for implementing, monitoring and maintaining the Microsoft network. This team consists of personnel responsible for:

- Network configuration and access management
- Network problem management
- Network capacity management

## Azure Environment

Azure is developed and managed by the Azure team, and provides a cloud platform based on machine virtualization. This means that customer code - whether it's deployed in a PaaS Worker Role or an IaaS Virtual Machine - executes in a Windows Server Hyper-V virtual machine. Every physical node in Azure has one or more virtual machines, also called instances, that are scheduled on physical CPU cores, are assigned dedicated RAM, and have controlled access to local disk and network I/O.

On each Azure node, there is a Hypervisor that runs directly over the hardware and divides a node into a variable number of Guest Virtual Machines (VMs). Each node also has one special Root VM, which runs the Host Operating System (OS), as shown in figure below. Fabric Agents (FAs) on Root VMs are used to manage Guest Agents (GAs) within Guest VMs. Isolation of the Root VM from the Guest VMs and the Guest VMs from one another is a key concept in Azure security architecture.



### *Fabric Controller Lifecycle Management*

In Azure, VMs (nodes) run on groups of physical servers known as "clusters", of approximately 1,000 machines. Each cluster is independently managed by a scaled-out and redundant platform Fabric Controller (FC) software component.

Each FC manages the lifecycle of VMs and applications running in its cluster, including provisioning and monitoring the health of the hardware under its control. The FC executes both automatic operations, like healing VM instances to healthy servers when it determines that the original server has failed, as well as application-management operations like deploying, updating, reimaging and scaling out applications. Dividing the datacenter into clusters isolates faults at the FC level, preventing certain classes of errors from affecting servers beyond the cluster in which they occur. FCs that serve a particular Azure cluster are grouped into FC Clusters.

### *FC Managed Operating Systems*

An Azure OS base image Virtual Hard Disk (VHD) is deployed on all Host, Native, and Guest VMs in the Azure production environment. The three types of FC managed OS images are:

1. **Host OS:** Host OS is a customized version of the Windows OS that runs on Host Machine Root VMs

2. **Native OS:** Native OS runs on Azure native tenants such as the FC itself, Azure Storage and Load Balancer that do not have any hypervisor

3. **Guest OS:** Guest OS runs on Guest VMs (for IaaS, FC will run customer provided images on a VHD)

The Host OS and Native OS are OS images that run on physical servers and native tenants and host the Fabric Agent and other Host components. The Guest OS provides the most up-to-date runtime environment for Azure customers and can be automatically upgraded with new OS releases or manually upgraded based on customer preference.

### *Software Development Kits*

Azure allows customers to create applications in many development languages. Microsoft provides language-specific Software Development Kits (SDKs) for .NET, Java, PHP, Ruby, Node.js and others. In addition, there is a general Azure SDK that provides basic support for any language, such as C++ or Python. These SDKs can be used with development tools such as Visual Studio and Eclipse.

These SDKs also support creating applications running outside the cloud that use Azure services. For example, a customer can build an application running on a Host that relies on Azure Blob Storage, or create a tool that automatically deploys Azure applications through the platform's management interface.

## Azure Services and Offerings

Azure services and offerings are grouped into categories discussed below. A complete list of Azure services and offerings available to customers is provided in the Azure Service Directory. Brief descriptions for each of the customer-facing services and offerings in scope for this report are provided below. Customers should consult extensive online documentation for additional information.

### *Compute*

App Service: App Service enables customers to quickly build, deploy, and scale enterprise-grade web, mobile, and applications and programming interface (API) apps that can run on a number of different platforms.

- App Service: API Apps: API Apps enables customers to build and consume Cloud APIs. Customers can connect their preferred version control system to their API Apps, and automatically deploy commits, making code changes.
- App Service: Mobile Apps: Mobile Apps allows customers to accelerate mobile application development by providing a turnkey way to structure storage, authenticate users, and send push notifications. Mobile Apps allows customers to build connected applications for any platform and deliver a consistent experience across devices.
- App Service: Web Apps: Web Apps offers secure and flexible development, deployment and scaling options for web applications of any size. Web Apps enables provisioning a production web application in minutes using a variety of methods including the Azure Portal, PowerShell scripts running on Windows, Command Line Interface tools running on any OS, source code control driven deployments, as well as from within the Visual Studio Integrated Development Environment (IDE).
- Azure App Service Static Web Apps: Static Web Apps offers streamlined full-stack development from source code to global high availability. It allows customers accelerated app development with a static front end and dynamic back end powered by serverless APIs. Customers experience high productivity with a tailored local development experience, GitHub native workflows to build and deploy apps, and unified hosting and management in the cloud.

Azure Arc Enabled Servers: Azure Arc Enabled Servers allows customers to manage, monitor and govern machines running on-premises or in other clouds, from Azure.

Azure Functions: Azure Functions is a serverless compute service that lets customers run event-triggered code without having to explicitly provision or manage infrastructure. Azure Functions is an event driven, compute-on-demand experience. Customers can leverage Azure Functions to build Hypertext Transfer Protocol (HTTP) endpoints accessible by mobile and Internet of Things (IoT) devices.

Azure Service Fabric: Azure Service Fabric is a distributed systems platform that makes it easy to package, deploy, and manage scalable and reliable microservices and containers. It is a micro-services platform used to build scalable managed applications for the cloud. Azure Service Fabric addresses significant challenges in developing and managing cloud applications by allowing developers and administrators to shift focus from infrastructure maintenance to implementation of mission-critical, demanding workloads.

Azure VM Image Builder: Azure VM Image Builder is an Azure Resource Provider service that allows customers to create custom virtual machine images.

Azure VMware Solution: Azure VMware Solution delivers a comprehensive VMware environment in Azure allowing customers to run native VMware workloads on Azure. Azure VMware Solution allows customers to seamlessly run, manage and secure applications across VMware environments and Microsoft Azure with a common operating framework.

Batch: Batch runs large-scale parallel applications and High-Performance Computing (HPC) workloads efficiently in the cloud. It allows customers to schedule compute-intensive tasks and dynamically adjust resources for their solution without managing the infrastructure. Customers can use Batch to scale out parallel workloads, manage the execution of tasks in a queue, and cloud-enable applications to offload compute jobs to the cloud.

Cloud Services: Cloud Services is a PaaS service designed to support applications that are scalable, reliable, and inexpensive to operate. Cloud Services is hosted on virtual machines. However, customers have more control over the VMs. Customers can install their own software on VMs that use Cloud Services and access them remotely. It removes the need to manage server infrastructure and lets customers build, deploy, and manage modern applications with web and worker roles.

Guest Configuration: Guest Configuration provides management and configuration capabilities to Azure compute resources in Azure and Arc VMs. Guest Configuration uses the Azure policy to audit the internal configuration of a VM's OS, deployed applications, and the environment configuration. The Guest Configuration is a digital security and risk engineering DevOps Kit baseline control and helps audit VM configurations.

Planned Maintenance: Planned Maintenance is responsible for the roll out of planned maintenance activities to the nodes and VMs in Azure.

Virtual Machines: Virtual Machines is one of the several types of on-demand, scalable computing resources that Azure offers. Virtual Machines, which includes Azure Reserved Virtual Machine Instances, lets customers deploy a Windows Server or a Linux image in the cloud. Customers can select images from a marketplace or use their own customized images. It gives customers the flexibility of virtualization without having to buy and maintain the physical hardware that runs it.

Virtual Machine Scale Sets: Virtual Machine Scale Sets service lets customers create and manage a group of identical, load balanced, and autoscaling VMs. It makes it possible to build highly scalable applications by allowing customers to deploy and manage identical VMs as a set. VM Scale sets are built on the Azure Resource Manager deployment model, are fully integrated with Azure load balancing and autoscaling, and support Windows and / or Linux custom images, and extensions.

Azure Virtual Desktop: Azure Virtual Desktop is a virtualization management service running on Azure that provisions and manages connections to virtual desktops and apps on Windows 7, Windows 10, Windows Server 2012 R2+ in single or multi-session environments. It allows users to set up a scalable and flexible environment as well as connect, deploy to, and manage virtual desktops.

### *Containers*

Azure Arc Enabled Kubernetes: Azure Arc Enabled Kubernetes allows customers (cluster operators) to use Azure as their single control plane for connecting, configuring and governing their Kubernetes clusters spread out across other public clouds and on-premise environments.

Azure Kubernetes Configuration Management: Azure Kubernetes Configuration Management allows customers (cluster operators) to use GitOps to manage configuration on various Kubernetes clusters - Azure Arc connected clusters, AKS clusters, and eventually other cluster types like Azure Red Hat OpenShift (ARO).

Azure Kubernetes Service (AKS): Azure Kubernetes Service is an enterprise ready managed service that allows customers to run Open source Kubernetes on Azure without having to manage it on their own. It also includes the functionality of Azure Container service (ACS), which was retired in calendar year Q1 2020. ACS was a container hosting environment which provided users the choice of container orchestration platforms such as Mesosphere DC/OS and Docker Swarm. AKS makes deploying and managing containerized applications easy. It offers serverless Kubernetes, an integrated continuous integration and continuous delivery (CI/CD) experience, and enterprise-grade security and governance. AKS unites the customer development and operations teams on a single platform to rapidly build, deliver, and scale applications with confidence.

Azure Red Hat OpenShift: Azure Red Hat OpenShift offering provides flexible, self-service deployment of fully managed OpenShift clusters. It helps customers maintain regulatory compliance and focus on their application development, while the master, infrastructure, and application nodes are patched, updated, and monitored by both Microsoft and Red Hat.

Container Instances: Container Instances enables the creation of containers as first-class objects in Azure, without requiring VM management and without enforcing any prescriptive application model. Container Instances is a solution for any scenario that can operate in isolated containers, without orchestration. Customer can run event-driven applications, quickly deploy from their container development pipelines, and run data processing and build jobs.

Container Registry: Container Registry allows customers the ability to store images for all types of container deployments including DC / OS, Docker Swarm, Kubernetes, and Azure services such as App Service, Batch, Azure Service Fabric, and others. Developers can manage the configuration of apps isolated from the configuration of the hosting environment. Container Registry reduces network latency and eliminates ingress / egress charges by keeping Docker registries in the same datacenters as customers' deployments. It provides local, network-close storage of container images within subscriptions, and full control over access and image names.

### *Networking*

Application Gateway: Application Gateway is a web traffic load balancer that enables customers to manage traffic to their web applications. It is an Azure-managed layer-7 solution providing HTTP load balancing, Web Application Firewall (WAF), Transport Layer Security (TLS) termination service, and session-based cookie affinity to Internet-facing or internal web applications.

Azure Bastion: Azure Bastion is a managed PaaS service that provides secure and seamless Remote Desktop Protocol (RDP) and Secure Shell (SSH) access to customer's virtual machines directly through the Azure Portal. Azure Bastion is provisioned directly in the customer Virtual Network (VNet) and supports all VMs in their VNet using SSL without any exposure through public IP addresses.

Azure DDoS Protection: Azure DDoS Protection is a fully automated solution aimed primarily at protecting resources against Distributed Denial of Service (DDoS) attacks. Azure DDoS Protection helps prevent service interruptions by eliminating harmful volumetric traffic flows.

Azure DNS: Azure DNS is a hosting service for Domain Name System (DNS) domains that provides name resolution by using Microsoft Azure infrastructure. Azure DNS lets customers host their DNS domains alongside their Azure apps and manage DNS records by using the same credentials, APIs, tools, and billing as their other Azure services.

Azure ExpressRoute: Azure ExpressRoute lets customers create private connections between Azure datacenters and customer's infrastructure located on-premises or in a colocation environment. ExpressRoute connections do not go over the public Internet, and offer more reliability, faster speeds, and lower latencies than typical Internet connections.

Azure Firewall: Azure Firewall is a managed cloud-based network security service that protects Azure virtual network resources. It is a fully stateful firewall as a service with built-in high availability and unrestricted cloud scalability. Customers can centrally create, enforce, and log application and network connectivity policies across subscriptions and virtual networks. Azure Firewall uses a static public IP address for virtual network resources allowing outside firewalls to identify traffic originating from a virtual network. This service is fully integrated with Azure Monitor Essentials for logging and analytics purposes.

Azure Firewall Manager: Azure Firewall Manager is a security management service that provides central security policy and route management for cloud-based security perimeters. Azure Firewall Manager simplifies central configuration and management of rules for multiple Azure Firewall instances, across Azure regions and subscriptions. This allows customers to automate Azure Firewall deployment to multiple secured virtual hubs and integrates with trusted security partner solutions for advanced services.

Azure Front Door: Azure Front Door (AFD) is Microsoft's highly available and scalable Web Application Acceleration Platform, Global HTTP Load Balancer, Application Protection and Content Delivery Network. AFD enables customers to build, operate and scale out their dynamic web application and static content. AFD provides customers' application with end-user performance, unified regional / stamp maintenance automation, Business Continuity and Disaster Recovery (BCDR) automation, unified client / user information, caching and service insights.

Azure Internet Analyzer: Azure Internet Analyzer is a client-side measurement platform that tests how changes to customer's networking infrastructure impact their client's / end-user's performance. Internet Analyzer uses a small JavaScript client embedded in the customer's web application to measure the latency from their end-users to customer selected set of network destinations (endpoints). Internet Analyzer allows customers to set up multiple side-by-side tests, allowing to evaluate a variety of scenarios as their infrastructure and needs evolve. It provides custom and preconfigured endpoints, providing a customer both the convenience and flexibility to make trusted performance decisions for their end-users.

Azure Private Link: Azure Private Link provides private connectivity from a virtual network to Azure PaaS, customer-owned, or Microsoft partner services. It simplifies the network architecture and secures the connection between endpoints in Azure by eliminating data exposure to the public Internet.

Azure Public IP: Azure Public IP allows internet resources to communicate inbound to Azure resources, as well as providing a predictable method for communicating outbound to the Internet and other public-facing Azure services. Customers can associate Azure Public IP addresses to Virtual Machine network interfaces, public load balancers, VPN gateways, and other resources.

Azure Route Server: Azure Route Server enables the customer's network appliances to exchange route information with Azure virtual networks dynamically. It allows customers to exchange routing information directly through Border Gateway Protocol (BGP) routing protocol between any Network Virtual Appliances (NVA) that supports the BGP routing protocol and the Azure Software Defined Network (SDN) in the Azure Virtual Network (VNET) without the need to manually configure or maintain route tables.

Azure Web Application Firewall: Azure Web Application Firewall helps protect customer's web apps from malicious attacks and top 10 Open Web Application Security Project (OWASP) security vulnerabilities, such as SQL injection and cross-site scripting. Cloud-native Azure Web Application Firewall service deploys in minutes and offers customized rules that meet the customer's web app security requirements.

Content Delivery Network: Content Delivery Network (CDN) sends audio, video, applications, images, and other files faster and more reliably to customers by using the servers that are closest to each user. This dramatically increases speed and availability. Due to its distributed global scale, CDN can handle sudden traffic spikes and heavy loads without new infrastructure costs or capacity worries. CDN is built on a highly scalable, reverse-proxy architecture with sophisticated DDoS identification and mitigation technologies. Customers can choose to use Azure CDN from Verizon or Akamai partners. Verizon and Akamai are not covered in this SOC report.

Load Balancer: Load Balancer distributes Internet and private network traffic among healthy service instances in cloud services or virtual machines. It lets customers achieve greater reliability and seamlessly add more capacity to their applications.

Microsoft Azure Peering Service: Microsoft Azure Peering Service is a networking service that enhances customer connectivity to Microsoft cloud services such as Microsoft 365, Dynamics 365, SaaS services, Azure, or any Microsoft services accessible via the public Internet. Microsoft has partnered with Internet Service Providers (ISPs), Internet Exchange Partners, and Software-Defined Cloud Interconnect (SDCI) providers worldwide to provide reliable and high-performing public connectivity with optimal routing from the customer to the Microsoft network.

Network Watcher: Network Watcher enables customers to monitor and diagnose conditions at a network scenario level. Network diagnostic and visualization tools available with Network Watcher allow customers to take packet captures on a VM, help them understand if an IP flow is allowed or denied on their Virtual Machine, find where their packet will be routed from a VM and gain insights to their network topology.

Traffic Manager: Traffic Manager is a DNS-based traffic load balancer that enables customers to distribute traffic optimally to services across global Azure regions, while providing high availability and responsiveness. Traffic Manager uses DNS to direct client requests to the most appropriate service endpoint based on a traffic-routing method and the health of the endpoints.

Virtual Network: Virtual Network lets customers create private networks in the cloud with full control over IP addresses, DNS servers, security rules, and traffic flows. Customers can securely connect a virtual network to on-premises networks by using a Virtual Private Network (VPN) tunnel, or connect privately by using the Azure ExpressRoute service.

Virtual Network NAT: Virtual Network NAT (network address translation) simplifies outbound-only Internet connectivity for virtual networks. When configured on a subnet, all outbound connectivity uses specified static

public IP addresses. Outbound connectivity is possible without a load balancer or public IP addresses directly attached to virtual machines.

VPN Gateway: VPN Gateway lets customers establish secure, cross-premises connections between their virtual network within Azure and on-premises IT infrastructure. VPN gateway sends encrypted traffic between Azure virtual networks over the Microsoft network. The connectivity offered by VPN Gateway is secure and uses the industry-standard protocols Internet Protocol Security (IPsec) and Internet Key Exchange (IKE).

Virtual WAN: Virtual WAN is a networking service that brings many networking, security and routing functionalities together to provide a single operational interface. This service enables customers to automate large-scale branch connectivity which unifies network and policy management by optimizing routing using Microsoft global network.

### *Storage*

Azure Archive Storage: Azure Archive Storage offers low-cost, durable, and highly available secure cloud storage optimized to store rarely accessed data that is stored for at least 180 days with flexible latency requirements (of the order of hours).

Azure Backup: Azure Backup protects Windows client data and shared files and folders on customer's corporate devices. Additionally, it protects Microsoft SharePoint, Exchange, SQL Server, Hyper-V virtual machines, and other applications in the customer's datacenter(s) integrated with System Center Data Protection Manager. Azure Backup enables customers to protect important data off-site with automated backup to Microsoft Azure. Customers can manage their cloud backups from the tools in Windows Server, Windows Server Essentials, or System Center Data Protection Manager. These tools allow the user to configure, monitor and recover backups to either a local disk or Azure Storage.

Azure Data Box: Azure Data Box offers offline data transfer devices which are shipped between the customer's datacenter(s) and Azure, with little to no impact to the network. Azure Data Boxes use standard network-attached storage (NAS) protocols (Server Message Block (SMB)/CIFs and NFS), AES encryption to protect data, and perform a post-upload sanitization process to ensure that all data is wiped clean from the device. The data movement can be one-time, periodic, or an initial bulk data transfer followed by periodic transfers.

Azure Data Lake Storage Gen1: Azure Data Lake Storage (Gen1) provides a single repository where customers can capture data of any size, type, and speed without forcing changes to their application as the data scales. In the store, data can be shared for collaboration with enterprise-grade security. It is also designed for high-performance processing and analytics from Hadoop Distributed File System (HDFS) applications (e.g., Azure HDInsight, Data Lake Analytics, Hortonworks, Cloudera, MapR) and tools, including support for low latency workloads. For example, data can be ingested in real-time from sensors and devices for IoT solutions, or from online shopping websites into the store without the restriction of fixed limits on account or file size.

Azure File Sync: Azure File Sync is used to centralize file shares in Azure Files, while keeping the flexibility, performance, and compatibility of an on-premises file server. Azure File Sync transforms Windows Server into a quick cache of any Azure file share.

Azure HPC Cache: Azure HPC Cache is a file cache that speeds access to data for HPC tasks by caching files in Azure. It brings the scalability of cloud computing to existing workflows while allowing large datasets to remain in existing NAS or in Azure Blob storage.

Azure Import / Export: Azure Import / Export allows customers to securely transfer large amounts of data to Azure Blob Storage by shipping hard disk drives to an Azure datacenter. Customers can also use this service to transfer data from Azure Blob Storage to hard disk drives and ship to their on-premises site. This service is suitable in situations where customers want to transfer several TBs of data to or from Azure, but uploading or downloading over the network is not feasible due to limited bandwidth or high network costs.

Azure NetApp Files: Azure NetApp Files enables enterprise line-of-business and storage professionals to migrate and run complex, file-based applications with no code change. It is widely used as the underlying shared file-storage service in various scenarios. These include migration (lift and shift) of POSIX-compliant Linux and Windows applications, SAP HANA, databases, HPC infrastructure and apps, and enterprise web applications.

Azure Site Recovery: Azure Site Recovery contributes to a customer's BCDR strategy by orchestrating replication of their servers running on-premises or on Azure. The on-premises physical servers and virtual machine servers can be replicated to Azure or to a secondary datacenter. The virtual machine servers running in any Azure region can also be replicated to a different Azure region. When a disaster occurs in the customer's primary location, customers can coordinate failover and recovery to the secondary location using Azure Site Recovery and ensure that applications / workloads continue to run in the secondary location. Customers can failback their workloads to the primary location when it resumes operations. It supports protection and recovery of heterogeneous workloads (including System Center managed / unmanaged Hyper-V workloads, VMware workloads). With Azure Site Recovery, customers can use a single dashboard to manage and monitor their deployment and also configure recovery plans with multiple machines to ensure that machines hosting tiered applications failover in the appropriate sequence.

Azure Storage: Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. The Storage access control model allows each subscription to create one or more Storage accounts. Each Storage account has a primary and secondary secret key that is used to control access to the data within the Storage account. Every Storage service account has redundant data copies for fault tolerance. Listed below are the different storage types supported by Azure Storage:

- Blobs (including Data Lake Storage Gen2): Blobs is Microsoft's object storage solution for the cloud. Blobs can be used to store large amounts of binary data. For example, Blob Storage can be used for an application to store video, or to backup data. Azure Data Lake Storage Gen2 (a feature of Blobs) provides a hierarchical namespace, per object Access Control List (ACLs), and HDFS APIs.

- Data Lake Storage Gen2: Data Lake Storage Gen2 is a highly scalable and cost-effective data lake solution for Big Data analytics. It combines the power of a high-performance file system with massive scale and economy to help accelerate time to insight. Data Lake Storage Gen2 extends Azure Blob Storage capabilities and is optimized for analytics workloads and compliant file system interfaces with no programming changes or data copying.

- Disks: A managed or an unmanaged disk is a VHD that is attached to a VM to store application and system data. This allows for a highly durable and available solution while still being simple and scalable.

- Files: Files offer shared storage for applications using the SMB protocol or Representational State Transfer (REST) protocol. Files can be used to completely replace or supplement traditional on-premises file servers or NAS devices. Applications running in Azure VMs, Cloud Services or from on-premises clients can access Files using SMB or REST.

- Queues: Queues is a service for storing large number of messages. Queues provide storage and delivery of messages between one or more applications and roles.

- Tables: Tables provide fast access to large amounts of structured data that do not require complex SQL queries. For example, Tables can be used to create a customer contact application that stores customer profile information and high volumes of user transaction.

- Azure Disk Storage: Azure Disk Storage offers high throughput, high Input / Output Operations Per Second, and consistent low latency disk storage for Azure IaaS virtual machines. It allows the ability to dynamically change the performance of the SSD along with a customer's workloads without the need to restart VMs. Azure Disk Storage is suited for data-intensive workloads such as SAP HANA, top tier databases, and transaction-heavy workloads.

- Cool Storage: Cool Storage is a low-cost storage tier for cooler data, where the data is not accessed often. Example use cases for Cool Storage include backups, media content, scientific data, compliance and archival data. Customers can use Cool Storage to retain data that is seldom accessed.

- Premium Storage: Premium Storage delivers high-performance and low-latency storage support for virtual machines with input / output (IO) intensive workloads. Premium Storage is designed for mission-critical production applications.

StorSimple: StorSimple is a hybrid cloud storage solution for primary storage, archiving, and disaster recovery. StorSimple optimizes total storage costs and data protection. It includes an on-premises Storage Area Network (SAN) solution that is a bottomless file server using Azure Blob Storage. StorSimple automatically arranges data in logical tiers based on current usage, age, and relationship to other data. Data that is most active is stored locally, while less active and inactive data is automatically migrated to the cloud. A StorSimple appliance is managed via the Azure Portal.

### *Databases*

Azure Health Data Services: Azure Health Data Services is an API for clinical health data that enables customers to create new systems of engagement for analytics, machine learning, and actionable intelligence with health data. Azure Health Data Services improves health technologies' interoperability and makes it easier to manage data.

Azure Cache for Redis: Azure Cache for Redis gives customers access to a secure, dedicated cache for their Azure applications. Based on the open source Redis server, the service allows quick access to frequently requested data. Azure Cache for Redis handles the management aspects of the cache instances, providing customers with replication of data, failover, and Secure Socket Layer (SSL) support for connecting to the cache.

Azure Cosmos DB: Azure Cosmos DB was built from the ground up with global distribution and horizontal scale at its core. It offers turnkey global distribution across any number of Azure regions by transparently scaling and replicating customers' data wherever their users are. Customers can elastically scale throughput and storage worldwide, and pay only for the throughput and storage they need. Azure Cosmos DB guarantees single-digit-millisecond latencies at the 99th percentile anywhere in the world, offers multiple well-defined consistency models to fine-tune performance, and guarantees high availability with multi-homing capabilities - all backed by industry-leading, comprehensive SLAs.

Azure Database for MariaDB: Azure Database for MariaDB is a relational database based on the open-source MariaDB Server engine. It is a fully managed database as a service offering that can handle mission-critical workloads with predictable performance and dynamic scalability.

Azure Database for MySQL: Azure Database for MySQL is a relational database and a fully managed service built on Microsoft's scalable cloud infrastructure for application developers. Its built-in features maximize performance, availability, and security. Azure Database for MySQL empowers developers to focus on application innovation instead of database management tasks.

Azure Database for PostgreSQL: Azure Database for PostgreSQL is a relational database and a fully managed service built on Microsoft's scalable cloud infrastructure for application developers. Its built-in features maximize performance, availability, and security. Azure Database for PostgreSQL empowers developers to focus on application innovation instead of database management tasks.

Azure Database Migration Service: Azure Database Migration Service helps customers assess and migrate their databases and solve their compatibility and migration issues. The service is designed as a seamless, end-to-end solution for moving on-premises databases to the cloud.

Azure SQL: Azure SQL is a relational database service that lets customers rapidly create, extend, and scale relational applications into the cloud. Azure SQL delivers mission-critical capabilities including predictable performance, scalability with no downtime, business continuity, and data protection - all with near-zero administration. Customers can focus on rapid application development and accelerating time to market, rather than on managing VMs and infrastructure. Because the service is based on the SQL Server engine, Azure SQL provides a familiar programming model based on T-SQL and supports existing SQL Server tools, libraries and APIs. Azure SQL includes SQL Server on Virtual Machines which enables customers to create a SQL Server on Azure that they can control and manage.

Azure Synapse Analytics: Azure Synapse Analytics, formerly known as SQL Data Warehouse, is a limitless analytics service that brings together enterprise data warehousing and Big Data analytics. It lets customers scale data, either on-premises or in the cloud. Azure Synapse Analytics lets customers use their existing T-SQL knowledge to integrate queries across structured and unstructured data. It integrates with Microsoft data platform tools, including Azure HDInsight, Machine Learning Studio, Data Factory, and Microsoft Power BI for a complete data-warehousing and business-intelligence solution in the cloud.

SQL Server Registry: SQL Server registry is a lightweight portal experience that enables customers to register their on-premises SQL Server instances to obtain Extended Security Updates (ESUs).

SQL Server Stretch Database: SQL Server Stretch Database helps customers migrate warm and cold transactional data transparently and securely to Azure while still providing inexpensive long data retention times.

### *Developer Tools*

Azure App Configuration: Azure App Configuration allows customers to manage configuration within the cloud. Customers can create App Configuration stores to store key-value settings and consume stored settings from within applications, deployment pipelines, release processes, microservices, and other Azure resources. App Configuration allows customers to store and manage configurations effectively and reliably, in real time, without affecting customers by avoiding time-consuming redeployments.

Azure DevTest Labs: Azure DevTest Labs helps developers and testers quickly create environments in Azure while minimizing waste and controlling cost. Azure DevTest Labs creates labs consisting of pre-configured bases or Azure Resource Manager templates allowing customers to test the latest version of their application.

Azure for Education: Azure for Education provides resources for students to learn about programming, cloud technologies, and world-class developer tools.

Azure Lab Services: Azure Lab Services streamlines and simplifies setting up and managing resources and environments in the cloud. Azure Lab Services can quickly provision Windows and Linux virtual machines, Azure PaaS services, or complex environments in labs through reusable custom templates.

GitHub AE: GitHub AE is a security-enhanced and compliant way to use GitHub in the cloud. GitHub AE enables customers to move DevOps workload to the cloud while meeting stringent security and compliance requirements. GitHub AE is fully managed, reliable, and scalable, allowing the customer to accelerate delivery without sacrificing risk management. GitHub AE offers one developer platform from idea to production. Customers can increase development velocity, while maintaining industry and regulatory compliance with unique security and access controls, workflow automation, and policy enforcement.

### *Analytics*

Azure Analysis Services: Azure Analysis Services, based on the proven analytics engine in SQL Server Analysis Services, is an enterprise grade Online analytical processing engine and BI modeling platform, offered as a fully managed PaaS service. Azure Analysis Services enables developers and BI professionals to create BI semantic models that can power highly interactive and rich analytical experiences in BI tools and custom applications.

Azure Data Explorer: Azure Data Explorer is a fast and highly scalable, fully managed data analytics service for real-time analysis on large volumes of data streaming from applications, websites, IoT devices and more. Azure Data Explorer makes it simple to ingest this data and enables customers to quickly perform complex ad hoc queries on the data.

Azure Data Share: Azure Data Share is a simple and safe service for sharing data, in any format and any size, from multiple sources with other organizations. Customers can control what they share, who receives the data, and the terms of use via a user-friendly interface.

Azure Stream Analytics: Azure Stream Analytics is an event-processing engine that helps customers gain insights from devices, sensors, cloud infrastructure, and existing data properties in real-time. Azure Stream Analytics is integrated out of the box with Event Hubs, and the combined solution can ingest millions of events and do analytics to help customers better understand patterns, power a dashboard, detect anomalies, or kick off an action while data is being streamed in real time. It can apply time-sensitive computations on real-time streams of data by providing a range of operators covering simple filters to complex correlations, and combining streams with historic records or reference data to derive business insights quickly.

Data Catalog: Data Catalog is a fully managed service that serves as a system of registration and system of discovery for enterprise data sources. It lets users - from analysts to data scientists to developers - register, discover, understand, and consume data sources. Customers can use crowdsourced annotations and metadata to capture tribal knowledge within their organization, shine light on hidden data, and get more value from their enterprise data sources.

Data Factory: Data Factory is a fully managed, serverless data integration service that refines raw data at cloud scale into actionable business insights. Customers can construct Extract, Transform, Load processes code free in an intuitive visual environment, and easily operationalize and manage the data pipelines at scale.

Data Lake Analytics: Data Lake Analytics is a distributed analytics service built on Apache Yet Another Resource Negotiator that scales dynamically so customers can focus on their business goals and not on distributed infrastructure. Instead of deploying, configuring and tuning hardware, customers can write queries to transform data and extract valuable insights. The analytics service can handle jobs of any scale instantly by simply setting the dial for how much power is needed. Customers only pay for their job when it is running, making the service cost-effective. The analytics service supports Azure Active Directory letting customers manage access and roles, integrated with on-premises identity system. It also includes U-SQL, a language that unifies the benefits of SQL with the expressive power of user code. U-SQL's scalable distributed runtime enables customers to efficiently analyze data in the store and across SQL Servers on Azure VMs, Azure SQL, and Azure Synapse Analytics.

HDInsight: HDInsight is a managed Apache Hadoop ecosystem offering in the cloud. It handles various amounts of data, scaling from terabytes to petabytes on demand, and can process unstructured or semi-structured data from web clickstreams, social media, server logs, devices, sensors, and more. HDInsight includes Apache Hbase, a columnar NoSQL database that runs on top of the HDFS. This supports large transactional processing (Online Transaction Processing) of non-relational data, enabling use cases like interactive websites or having sensor data written to Azure Blob Storage. HDInsight also includes Apache Storm, an open-source stream analytics platform that can process real-time events at large-scale. This allows processing of millions of events as they are generated, enabling use cases like IoT and gaining insights from connected devices or web-triggered events. Furthermore, HDInsight includes Apache Spark, an open-source project in the Apache ecosystem that can run large-scale data analytics applications in memory. Lastly, HDInsight incorporates R Server for Hadoop, a scale-out implementation of one of the most popular programming languages for statistical computing and machine learning. HDInsight offers Linux clusters when deploying Big Data workloads into Azure.

Power BI Embedded: Power BI Embedded is a service which simplifies how customers use Power BI capabilities with embedded analytics. Power BI Embedded simplifies Power BI capabilities by helping customers quickly add visuals, reports, and dashboards to their apps, similar to the way apps built on Microsoft Azure use services like Machine Learning and IoT. Customers can make quick, informed decisions in context through easy-to-navigate data exploration in their apps.

### *AI + Machine Learning*

AI Builder: AI Builder is integrated with Power Platform and Power Automate capabilities that help customers improve business performance by automating processes and predicting outcomes. AI Builder is a turnkey solution that brings the power of AI through a point-and-click experience. With AI Builder, customers can add intelligence to their applications with little to no coding or data science experience.

Azure Applied AI Services: Azure Applied AI Services is a portfolio of high-level services that enable developers to quickly unlock the value of data by applying AI into their key business scenarios. Built on top of the AI APIs of Azure Cognitive Services, Azure Applied AI Services are optimized for critical tasks ranging from monitoring and diagnosing metric anomalies, mining knowledge from documents, enhancing the customer experience through transcription analysis, boosting literacy in the classroom, document understanding, etc.

Azure Bot Service: Azure Bot Service helps developers build bots / intelligent agents and connect them to the communication channels their users are in. Azure Bot Service solution provides a live service (connectivity switch), along with SDK documentation, solution templates, samples, and a directory of bots created by developers.

Azure Open Datasets: Azure Open Datasets service offers customers curated public datasets that can be used to add scenario-specific features to machine learning solutions for more accurate models. Azure Open Datasets are integrated into Azure Machine Learning and readily available to Azure Databricks and Machine Learning Studio (classic). Customers can also access the datasets through APIs and use them in other products, such as Power BI and Azure Data Factory. It includes public-domain data for weather, census, holidays, public safety, and location that helps customers train machine learning models and enrich predictive solutions.

Azure Machine Learning: Azure Machine Learning (ML) is a cloud service that allows data scientists and developers to prepare data, train, and deploy machine learning models. It improves productivity and lowers costs through capabilities such as automated ML, autoscaling compute, hosted notebooks and ML Ops. It is open-source friendly and works with any Python framework, such as PyTorch, TensorFlow, or scikit-learn.

Cognitive Services: Cognitive Services is the platform on which an evolving portfolio of REST APIs and SDKs enables developers to easily add intelligent services into their solutions to leverage the power of Microsoft's natural data understanding.

Cognitive Services: Anomaly Detector: Cognitive Services: Anomaly Detector enables customers to monitor and detect abnormalities in time series data with machine learning. It utilizes an API which adapts by automatically identifying and applying the best-fitting models to data, regardless of industry, scenario, or data volume. Using time series data, the API determines boundaries for anomaly detection, expected values, and which data points are anomalies.

Cognitive Services: Computer Vision: Cognitive Services: Computer Vision provides services to accurately identify and analyze content within images and videos. It also provides customers the ability to extract rich information from images to categorize and process visual data - and protect users from unwanted content.

Cognitive Services: Content Moderator: Cognitive Services: Content Moderator is a suite of intelligent screening tools that enhance the safety of customer's platform. Image, text, and video moderation can be configured to support policy requirements by alerting customers to potential issues such as pornography, racism, profanity, violence, and more.

Cognitive Services: Custom Vision: Cognitive Services: Custom Vision is a cognitive service that can train and deploy image classifiers and object detectors. The custom models trained by the AI service infer the contents of images based on visual characteristics.

Cognitive Services: Face: Cognitive Services: Face is a service that has two main functions - face detection with attributes and face recognition. It provides customers the ability to detect human faces and compare similar ones, organize people into groups according to visual similarity, and identify previously tagged people in images.

Cognitive Services: Form Recognizer: Cognitive Services: Form Recognizer is a cognitive service that uses machine learning technology to identify and extract text, key / value pairs and table data from form documents. It ingests text from forms and outputs structured data that includes the relationships in the original file. Customers receive accurate results that are tailored to specific content without heavy manual intervention or extensive data science expertise. Form Recognizer is comprised of custom models, the prebuilt receipt model, and the layout API. Customers can call Form Recognizer models by using a REST API to reduce complexity and integrate it into a workflow or an application.

Cognitive Services: Immersive Reader: Immersive Reader is a service that lets customers embed text reading and comprehension capabilities into applications. Immersive Reader helps users of any age and reading ability with features like reading aloud, translating languages, and focusing attention through highlighting and other design elements.

Cognitive Services: Language Understanding: Cognitive Services: Language Understanding is a cloud-based API service that enables developers to build their custom language models (i.e., intent classifier and entity extractor). It enables its customers to integrate those custom machine-learning models into any conversational application, or unstructured text to predict, and pull out relevant, detailed information presented in a structured format i.e., JSON.

Cognitive Services: Personalizer: Cognitive Services: Personalizer offers customers automatic model optimization based on reinforcement learning through a cloud-based API service that helps client applications choose the best, single content item to show each user. Personalizer collects and uses real-time information customers provide about content and context in order to select the most relevant content. Personalizer uses system monitoring of customer and user behavior to report a reward score in order to improve its ability to select the best content based on the context information it receives. Content collected consists of any unit of information such as text, images, URLs, emails, and more.

Cognitive Services: QnA Maker: Cognitive Services: QnA Maker is a cognitive service offering deployed on Azure. The endpoint is used by third party developers to create knowledge base endpoints. It allows users to distill information into an easy-to-navigate FAQ.

Cognitive Services: Speech Services: Cognitive Services: Speech Services is an Azure service that offers speech to text, text to speech and speech translation using base (out of the box) and custom models.

Cognitive Services: Text Analytics: Cognitive Services: Text Analytics is a cloud-based service that provides advanced natural language processing over raw text, and includes five main functions: sentiment analysis, key phrase extraction, named entities recognition, linked entities, and language detection.

Cognitive Services: Translator: Cognitive Services: Translator is a cloud-based machine translation service, translating natural language text between more than 60 languages, via a REST-based web service API. Besides translation, the API provides functions for dictionary lookup, language detection and sentence breaking.

Cognitive Services: Video Indexer: Cognitive Services: Video Indexer is a cloud application built as a cognitive video indexing platform that processes the videos that users upload and creates a cognitive index of the content within the video. It enables customers to extract the insights from videos using Video Indexer models.

Machine Learning Studio (Classic): Machine Learning Studio (Classic) is a service that enables users to experiment with their data, develop and train a model using training data and operationalize the trained model as a web service that can be called for predictive analytics.

Microsoft Autonomous Development Platform: Autonomous Development platform enables automobile customers to develop, validate and deploy their autonomous driving capabilities. It provides an integrated solution that is extensible, highly automated and easy to use. It leverages key Azure services like storage, compute and various data platforms to enable a data driven development cycle.

Microsoft Genomics: Microsoft Genomics offers a cloud implementation of the Burrows-Wheeler Aligner and the Genome Analysis Toolkit for secondary analysis which are then used for genome alignment and variant calling.

Azure Health Bot: Azure Health Bot is an intelligent, highly personalized virtual health assistant that aims to improve the conversation between healthcare providers, payers and patients, via conversational navigation. It allows healthcare providers and payers to empower their users to get information related to their health, such as checking their symptoms, asking about their health plans, and receiving personalized, meaningful, credible answers, in an easy, self-serve and conversational way.

### *Internet of Things*

Azure Defender for IoT: Azure Defender for IoT provides customers with security protection by delivering unified visibility and control, adaptive threat prevention, and intelligent threat detection and response across IoT devices, IoT edges and IoT hubs running on-premises and in Azure cloud. It provides unified security management that enables end-to-end threat detection and analysis across hybrid cloud workloads and on customer's Azure IoT solution.

Azure Digital Twins: Azure Digital Twins is an IoT platform that enables the customer's business to create a digital representation of real-world things, places, business processes, and people.

Azure IoT Central: Azure IoT Central is a managed IoT SaaS solution that makes it easy to connect, monitor, and manage IoT assets at scale.

Azure IoT Hub: Azure IoT Hub is used to connect, monitor, and control billions of IoT assets running on a broad set of operating systems and protocols. Azure IoT Hub establishes reliable, bi-directional communication with assets, even if they're intermittently connected, and analyzes and acts on incoming telemetry data. Customers can enhance the security of their IoT solutions by using per-device authentication to communicate with devices that have the appropriate credentials. Customers can also revoke access rights to specific devices to maintain the integrity of their system.

Azure Sphere: Azure Sphere is a secured, high-level application platform with built-in communication and security features for internet-connected devices. It comprises a secured, connected, crossover microcontroller unit, a custom high-level Linux-based OS, and a cloud-based security service that provides continuous, renewable security.

Azure Time Series Insights: Azure Time Series Insights is used to collect, process, store, analyze, and query highly contextualized, time-series-optimized IoT-scale data. Time Series Insights is ideal for ad hoc data exploration and operational analysis. It is a uniquely extensible and customized service offering that meets the broad needs of industrial IoT deployments.

Event Grid: Event Grid is a high scale Pub / Sub service which enables event-driven programming. It integrates with webhooks for delivering events.

Event Hubs: Event Hubs is a Big Data streaming platform and event ingestion service capable of receiving and processing millions of events per second. Event Hubs can process, and store events, data, or telemetry produced by distributed software and devices. Data sent to an event hub can be transformed and stored by using any real-time analytics provider or batching / storage adapters. Event Hubs for Apache Kafka enables native Kafka clients, tools, and applications such as Mirror Maker, Apache Flink, and Akka Streams to work seamlessly with Event Hubs with only configuration changes. Event Hubs uses Advanced Message Queuing Protocol (AMQP), HTTP, and Kafka as its primary protocols.

Microsoft Cloud for Sustainability: Microsoft Cloud for Sustainability enables customers to reach their environmental sustainability goals and advance their conservation efforts with secure, globally scalable, and innovative IoT solutions. Customers can reduce their energy usage in their factory or building, monitor the quality of their water output and decrease material waste spillage, and also to help prevent wildlife poaching and keep watch on endangered habitats.

Notification Hubs: Notification Hubs is a massively scalable mobile push notification engine for sending notifications to Android, iOS, and Windows devices. It aggregates sending notifications through the Apple Push Notification service, Firebase Cloud Messaging service, Windows Push Notification Service, Microsoft Push Notification Service, and more. It allows customers to tailor notifications to specific customers or entire audiences with just a few lines of code and do it across any platform.

Windows 10 IoT Core Services: Windows 10 IoT Core Services is a cloud subscription-based service that provides essential aids needed to commercialize a device on Windows 10 IoT Core. Through this subscription, Original Equipment Manufacturers (OEMs) have access to support channel, along with services to publish device updates and assess device health. Windows 10 IoT Core services offers monthly security and reliability updates, keeping devices stable and secure and utilizes Device Update Center to control device updates using the same content distribution network that is used by millions of customers to manage Windows updates.

### *Integration*

API Management: API Management lets customers publish APIs to developers, partners, and employees securely and at scale. API publishers can use the service to quickly create consistent and modern API gateways for existing backend services hosted anywhere.

Logic Apps: Logic Apps automates the access and use of data across clouds without writing code. Customers can connect apps, data, and devices anywhere-on-premises or in the cloud, with Azure's large ecosystem of SaaS and cloud-based connectors that includes Salesforce, Office 365, Twitter, Dropbox, Google services, and more.

Service Bus: Service Bus is a multi-tenant cloud messaging service that can be used to send information between applications and services. The asynchronous operations enable flexible, brokered messaging, along with structured first-in, first-out messaging, and publish / subscribe capabilities. Service Bus uses AMQP, Service Bus Messaging Protocol (SBMP), and HTTP as its primary protocols.

### *Identity*

Azure Active Directory (AAD): Azure Active Directory provides identity management and access control for cloud applications. To simplify user access to cloud applications, customers can synchronize on-premises identities, and enable single sign-on. AAD comes in three editions: Free, Basic, and Premium. Self-service credentials management is a feature of AAD that allows Azure AD tenant administrators to register for and subsequently reset their passwords without needing to contact Microsoft support. Microsoft Online Directory Services (MSODS) is also a feature of AAD that provides the backend to support authentication and provisioning for AAD.

Azure Active Directory B2C: Azure Active Directory B2C extends Azure Active Directory capabilities to manage consumer identities. Azure Active Directory B2C is a comprehensive identity management solution for consumer-facing applications that can be integrated into any platform, and accessed from any device.

Azure Active Directory Domain Services: Azure Active Directory Domain Services provides managed domain services such as domain join, group policy, LDAP, Kerberos / NTLM authentication that are fully compatible with Windows Server Active Directory (AD). Customers can consume these domain services without the need to deploy, manage, and patch domain controllers in the cloud. Azure Active Directory Domain Services integrates with the existing Azure Active Directory tenant, thus making it possible for users to log in using their corporate credentials.

Azure Information Protection: Azure Information Protection controls and helps secure email, documents, and sensitive data that customers share outside their company walls. Azure Information Protection provides enhanced data protection capabilities to customers and assists them with classification of data using labels and permissions. Azure Information Protection includes Azure Rights Management, which used to be a standalone Azure service.

### *Management and Governance*

Application Change Analysis: Application Change Analysis is a subscription-level Azure resource provider. It checks for resource changes in the subscription, and provides data for various diagnostic tools to help users understand what changes might have caused issues.

Automation: Automation lets customers create, deploy, monitor, and maintain resources in their Azure environment automatically by using a highly scalable and reliable workflow execution engine. Automation enables customers to create their PowerShell content (Runbooks) or choose from many available in the Runbook Gallery, and trigger job execution (scheduled or on-demand). Customers can also upload their own PowerShell modules and make use of them in their Runbooks. The distributed service takes care of executing the jobs per customer-specified schedule in a reliable manner, providing tenant context, tracking, and debugging as well as authoring experience.

Azure Advisor: Azure Advisor is a personalized recommendation engine that helps customers follow Azure best practices. It analyzes Azure resource configuration and usage telemetry, and then provides recommendations that can reduce costs and improve the performance, security, and reliability of applications.

Azure Blueprints: Azure Blueprints provides governed subscriptions to enterprise customers, simplifying largescale Azure deployments by packaging key environment artifacts, role-based access controls, and policies in a single blueprint definition.

Azure Lighthouse: Azure Lighthouse offers service providers a single control plane to view and manage Azure across all their customers with higher automation, scale, and enhanced governance. With Azure Lighthouse, service providers can deliver managed services using comprehensive and robust management tooling built into the Azure platform. This offering can also benefit enterprise IT organizations by managing resources across multiple tenants.

Azure Managed Applications: Azure Managed Applications enables customers to offer cloud solutions that are easy for consumers to deploy and operate. It can help customers implement the infrastructure and provide ongoing support. A managed application can be made available to all customers or only to users in the customer's organization by publishing it in the Azure marketplace or to an internal catalog, respectively.

Azure Migrate: Azure Migrate enables customers to migrate to Azure, also serving as a single point to track migrations to Azure. Customers can choose from Microsoft first-party and Independent Software Vendor (ISV) partner solutions for their assessment and migration activities. Customers can plan and carry out migration of their servers using the Server Assessment and Server Migration tools; these are Microsoft solutions available on Azure Migrate. Server Assessment helps to discover on-premise applications and servers (Hyper-V and VMware VMs), and provides a migration assessment: a mapping from discovered servers to recommended Azure VMs, migration readiness analysis and cost estimates to run the VMs in Azure. It allows for dependency visualization to view dependencies of a single VM or a group of VMs. Server Migration allows customers to migrate the on-premises servers (non-virtualized physical or virtualized using Hyper-V and VMware) to Azure. Microsoft solutions to assess and migrate database workloads - Database Assessment and Database Migration - are also discoverable on Azure Migrate. In addition to these tools, ISV partner tools for assessment and migration are also discoverable on Azure Migrate. The machines discovered using these tools and the assessment and migration activities conducted using these tools can be tracked on Azure Migrate; this helps customers to track all their migration activities at one place.

Azure Monitor: Azure Monitor provides full observability into a customer's applications, infrastructure and networks and collects, analyzes and acts on telemetry data from Azure and on-premises environments. It helps customers maximize performance and availability of applications and proactively identifies problems in real time. It includes, but is not limited to, the following four services: Azure Monitor Essentials, Application Insights, Application Insights Profiler, and Log Analytics.

- Azure Monitor Essentials: Azure Monitor Essentials is a centralized dashboard which provides detailed up-to-date performance and utilization data, access to the activity log that tracks every API call, and diagnostic logs that help customers debug issues in their Azure resources.

- Application Insights: Application Insights is used to monitor any connected App; It is on by default to be able to monitor multiple types of Azure resources, particularly Web Applications. It includes analytics tools to help diagnose issues and understand what users do with the App. It can monitor and analyze telemetry from mobile apps by integrating with Visual Studio App Center.

- Application Insights Profiler: Application Insights Profiler is used to help understand and troubleshoot performance issues in production. It helps teams collect performance data in a low-impact way to minimize overhead to the system.

- Log Analytics: Log Analytics enables customers to collect, correlate and visualize all their machine data, such as event logs, network logs, performance data, and more, from both on-premises and cloud assets. It enables transformation of machine data into near real-time operational intelligence for better decision making. Customers can search, correlate, or combine outputs of search from multiple data sources regardless of volume, format, or location. They can also visualize their data, separate signals from noise, with powerful log-management capabilities.

Azure Policy: Azure Policy provides real-time enforcement and compliance assessment on Azure resources to apply standards and guardrails.

Azure Purview: Azure Purview is a unified data governance service that helps customers manage and govern on-premises, multi-cloud, and Software-as-a-Service (SaaS) data. Customers can easily create a holistic, up-to-date map of their data landscape with automated data discovery, sensitive data classification, and end-to-end data lineage.

Azure Resource Graph: Azure Resource Graph is a service designed to extend Azure Resource Management by providing efficient and performant resource exploration with the ability to query at scale across a given set of subscriptions so that customers can effectively govern their environment. Azure Resource Graph offers the ability to query resources with complex filtering, grouping and sorting by resource properties and the ability to iteratively explore resources based on governance requirements. Resource Graph also offers the ability to assess the impact of applying policies in a vast cloud environment.

Azure Resource Manager (ARM): Azure Resource Manager (ARM) enables customers to repeatedly deploy their app and have confidence that their resources are deployed in a consistent state. Customers can define the infrastructure and dependencies for their app in a single declarative template. This template is flexible enough for use across all customer environments such as test, staging, or production. If customers create a solution from the Azure Marketplace, the solution will automatically include a template that customers can use for their app. With Azure Resource Manager, customers can put resources with a common lifecycle into a resource group that can be deployed or deleted in a single action. Customers can see which resources are linked by any dependencies. Moreover, they can control who in their organization can perform actions on the resources. Customers manage permissions by defining roles and adding users or groups to the roles. For critical resources, they can apply an explicit lock that prevents users from deleting or modifying the resource. ARM logs all user actions so customers can audit those actions. For each action, the audit log contains information about the user, time, events, and status.

Azure Signup Portal: Azure Signup Portal enables customers to sign up for Azure subscriptions. The service handles pre-requisites for signup such as Commerce account creation, Payment Instrument attachment, agreement acceptance, etc., and then finally funnels the user down to provisioning of a new subscription.

Cloud Shell: Cloud Shell provides a web-based command line experience from Ibiza portal, Azure mobile, docs.microsoft.com, shell.azure.com, and Visual Studio Code. Both Bash and PowerShell experiences are available for customers to choose from.

Cost Management: Cost management is an external offering for cloud cost management capabilities included with Azure subscriptions for financial governance for the customer's organization. It provides the ability to explore cost and usage data via multidimensional analysis, where creating customized filters and expressions allow the customer to answer consumption-related questions for their Azure resources.

Microsoft Azure Portal: Microsoft Azure Portal provides a framework SDK, telemetry pipeline and infrastructure for Microsoft Azure services to be hosted inside the Azure Portal shell, and manages and monitors the required components to allow Azure services to run in a single, unified console. Azure is designed to abstract much of the infrastructure and complexity that typically underlies applications (i.e., servers, operating systems, and network) so that developers can focus on building and deploying applications. Microsoft Azure portal simplifies the development work for Azure service owners and developers by providing a comprehensive SDK with tools and controls for easily building and packaging the service applications. Customers manage these Azure applications through the Microsoft Azure Portal and Service Management API (SMAPI). Users who have access to Azure customer applications are authenticated based on their Microsoft Accounts (MSA) and / or Organizational Accounts. Azure customer billing is handled by MOCP. MOCP and MSA / Organizational Accounts and their associated authentication mechanisms are not in scope for this SOC report.

Quota+Usage Blade: Quota+Usage Blade enables Azure end customers to view and manage quotas for Azure Services by subscription. It provides the capability to request Quota increase inline for adjustable quotas and eliminate latency between the fulfillment and what customer can see in their portal.

Scheduler: Scheduler lets customers invoke actions that call HTTP/S endpoints or post messages to an Azure Storage queue, Service Bus queue, or Service Bus topic on any schedule. It creates jobs that reliably call services either inside or outside of Azure and run those jobs right away, on a regular or irregular schedule, or at a future date. Scheduler was retired in calendar year Q4 2019 with all of the service functionality moved to Logic Apps. However, this service continues to support existing customers until it is fully decommissioned.

***Security***

Trusted Hardware Identity Management: Trusted Hardware Identity Management offers customers with solutions to enable isolation of sensitive data while it is being processed in the cloud. Trusted Hardware Identity Management lets processing of data from multiple sources without exposing the input data to other parties. This type of secure computation enables many scenarios like anti-money laundering, fraud-detection, and secure analysis of healthcare data.

Azure Dedicated HSM: Azure Dedicated HSM provides cryptographic key storage in Azure where the customer has full administrative control over the Hardware Security Module (HSM). It offers a solution for customers who require the most stringent security requirements.

Azure Security Center: Azure Security Center helps customers prevent, detect, and respond to threats with increased visibility into and control over the security of Azure resources. It provides integrated security monitoring and policy management across Azure subscriptions, helps detect threats that might otherwise go unnoticed, and works with a broad ecosystem of security solutions. Key capabilities include monitoring the security state of customer's Azure resources, policy-driven security maintenance, analysis of security data while

applying advanced analytics, machine learning and behavioral analysis, prioritized security alerts as well as insights into the source of the attack and impacted resources.

Azure Sentinel: Azure Sentinel is a cloud-native Security Information and Event Management (SIEM) platform that uses built-in AI to help analyze large volumes of data across an enterprise. Azure Sentinel aggregates data from all sources, including users, applications, servers, and devices running on-premises or in any cloud, letting customers reason over millions of records in a few seconds. It includes built-in connectors for easy onboarding of security solutions.

Customer Lockbox for Microsoft Azure: Customer Lockbox for Microsoft Azure provides an interface for customers to review and approve or reject customer data access requests. It is used in cases where a Microsoft engineer needs to access customer data during a support request.

Key Vault: Key Vault safeguards keys and other secrets in the cloud by using HSMs. It protects cryptographic keys and small secrets like passwords with keys stored in HSMs. For added assurance, customers can import or generate keys in HSMs that are FIPS 140-2 Level 2 certified. Key Vault is designed so that Microsoft does not see or extract customer keys. Customers can create new keys for Dev-Test in minutes and migrate seamlessly to production keys managed by security operations. Key Vault scales to meet the demands of cloud applications without the need to provision, deploy, and manage HSMs and key management software.

Microsoft Azure Attestation: Microsoft Azure Attestation enables customers to verify the identity and security posture of a platform before the user interacts with it. Azure Attestation receives evidence from the platform, validates it with security standards, evaluates it against configurable policies, and produces an attestation token for claims-based applications. The service supports attestation of trusted platform modules (TPMs) and trusted execution environments (TEEs) and virtualization-based security (VBS) enclaves.

Multi-Factor Authentication: Multi-Factor Authentication (MFA) helps prevent unauthorized access to on-premises and cloud applications by providing an additional layer of authentication. MFA follows organizational security and compliance standards while also addressing user demand for convenient access. MFA delivers strong authentication via a range of options, including mobile apps, phone calls, and text messages, allowing users to choose the method that works best for them.

### *Media*

Azure Media Services: Azure Media Services offers cloud-based versions of many existing technologies from the Microsoft Media Platform and Microsoft media partners, including ingest, encoding, format conversion, content protection and both on-demand and live streaming capabilities. Whether enhancing existing solutions or creating new workflows, customers can combine and manage Media Services to create custom workflows that fit every need.

### *Web*

Azure Cognitive Search: Azure Cognitive Search is a search as a service cloud solution that provides developers with APIs and tools for adding a rich search experience over customers' data in web, mobile, and enterprise applications.

Azure Maps: Azure Maps is a collection of geospatial services and SDKs that use fresh mapping data to provide geographic context to web and mobile applications. Azure Maps enables features such as map drawing, routing, search, time zones and traffic. The APIs can be subscribed to by customers in the Azure Portal or ARM.

Azure SignalR Service: Azure SignalR service is a managed service to help customers easily build real-time applications with SignalR technology. This real-time functionality allows the service to push content updates to connected clients, such as a single page web or a mobile application. As a result, clients are updated without the need to poll the server or submit new HTTP requests for updates.

Azure Spring Cloud Service: Azure Spring Cloud service makes it easy to deploy Spring Boot-based microservice applications to Azure with zero code changes. It manages the infrastructure of Spring Cloud applications, so developers can focus on their code. It provides lifecycle management using comprehensive monitoring and diagnostics, configuration management, service discovery, CI/CD integration, blue-green deployments, and more.

Azure Web PubSub: The Azure Web PubSub service helps customers build real-time messaging web applications using WebSockets and the publish-subscribe pattern easily. This real-time functionality allows publishing content updates between server and connected clients (for example a single page web application or mobile application).

### *Mixed Reality*

Azure Remote Rendering: Azure Remote Rendering enables customers to render high quality interactive 3D content in the cloud and stream it in real-time to devices running on the edge.

Azure Spatial Anchors: Azure Spatial Anchors helps customers create spatially aware mixed reality experiences across iOS, Android, and HoloLens devices. Customers can use this cross-platform service to unlock mixed reality capabilities like wayfinding, and enhance collaboration in facilities management, training, gaming, and other scenarios.

### *Internal Supporting Services*[8]

Internal Supporting Services is a collection of services that are not directly available to third-party customers. They are included in SOC examination scope for Azure and Azure Government because they are critical to platform operations or support dependencies by first-party services, e.g., Office 365 and Dynamics 365.

**Access Monitoring**: Access Monitoring (AM) evaluates permissions throughout the infrastructure to report on effective access across Cloud + AI. AM drives reporting in the quarterly User Access Review and several KPIs inside the division.

**AIP Masters**: AIP Masters is a data processing pipeline that produces two business intelligence data sets (Azure Usage and Customer Catalog) used by other Azure services. The Azure Usage data set includes consumption data of Azure services by Azure customers at the subscription and meter level and the Customer Catalog dataset contains non-PII customer metadata and identifiers associated with Azure subscriptions.

**Asimov Event Forwarder**: Asimov Event Forwarder reads full event stream from OneDS Collector and breaks it apart into separate event streams based upon a set of subscription matching criteria. These event streams are then forwarded to the downstream services which subscribe to that stream.

**Autopilot Security**: Autopilot Security manages major parts of the security of the Azure core control plane, such as Certificate management and rollover, as well as the management of encryption and decryption keys. These services are related to Autopilot and Pilotfish systems that the rest of the Azure stack depends on.

**AzCP Platform**[12]: AzCP Platform is a set of Service Fabric (SF) applications that install a SF cluster with a declarative deployment model paired with a collection of microservices to fill in gaps in the out-of-the-box support for common application needs within the Azure Control Plane.

[12] Examination period for this offering / service was from October 1, 2021 to March 31, 2022.

**Azure Marketplace Portal**: Azure Marketplace Portal is the new marketplace for Azure applications. It is an online store for thousands of certified, open source, and community software applications, developer services, and data pre-configured for Azure.

**Azure Allocator**[12]: Azure Allocator allocates customer workloads to physical hardware capacity in Azure.

**Azure Code Scanning**[12]: Azure Code Scanning offers anti-malware scanning service for Azure service teams and services to protect against malware. Azure Code Scanning uses multiple anti-malware scanning engines to detect malware and Potentially Unwanted Programs (PUP).

**Azure Networking**: Azure Networking is used to provide all datacenter connectivity for Azure. Azure Networking is completely transparent to Azure customers who cannot interact directly with any physical network device. The Azure Networking service provides APIs to manage network devices in Azure datacenters. It is responsible for performing write operations to the network devices, including any operation that can change the code or configuration on the devices. The API exposed by Azure Networking is used to perform certain operations, e.g., enable / disable a port for an unresponsive blade. It hosts all code and data necessary to manage network devices and does not have any dependency on services that are deployed after the build out.

**Azure Notebooks Component**: Azure Notebooks Component is an internal service that allows Microsoft teams to embed a component that provides a Jupyter notebook canvas allowing teams to add themes, languages, etc. to their applications.

**Azure Security Monitoring (ASM SLAM)**: ASM SLAM contains the features and services related to Security Monitoring in Azure. This includes Azure Security Pack which is deployed by services to configure their security monitoring.

**Azure Service Health**: Azure Service Health is a suite of experiences that provide personalized guidance and support when issues in Azure services are affecting or may affect customers in the future.

**Azure Service Manager (RDFE)**[6]: Azure Service Manager (RDFE) is a communication path from the user to the Fabric used to manage Azure services. It represents the publicly exposed classic APIs, which is the frontend to the Azure Portal and the SMAPI. All requests from the user go through Azure Service Manager (RDFE) or the newer ARM.

**Azure Stack Bridge**: Azure Stack Bridge is an integration service which provides hybrid capabilities between on-premise Azure Stack deployments and the online Azure cloud.

**Azure Stack Edge Service**: Azure Stack Edge Service, formerly known as Data Box Edge Service, manages appliances on customer premises that ingest data to customer storage account over network.

**Azure System Lockdown**: Azure System Lockdown is a feature within Azure Security Pack which monitors and audits applications running on other services in the execution environment.

**Azure Watson**: Azure Watson is an internal tool for service troubleshooting and crash dump analysis.

**Blueshift Analytics**[12]: Blueshift Analytics is a Big Data service for internal Microsoft allowing them to run large scale batch jobs on data stored in Azure Data Lake Store (ADLS) gen 2.

**Cloudfit**: Cloudfit is a service that provides machine utilization analysis and recommendations to improve cost of goods sold (COGS) for all Microsoft services.

**Cognitive Services: Container Platform:** Cognitive Services: Container Platform is the backend platform that hosts multiple Cognitive Services offerings.

**CoreWAN**: CoreWAN is used to connect all Microsoft products worldwide to the Internet. It is composed of software, firmware, hardware devices, physical sites around the world, and terrestrial fiber optic cables, submarine fiber optic cables, and leased circuits from carriers.

**CSCP-ReferenceSystems**: CSCP Reference Systems enable the automation of capacity planning, management and execution with a set of data and services that are the "central source of truth" for Master Data with continuous validation of accuracy, freshness and completeness.

**Datacenter Service Configuration Manager (dSCM):** dSCM enables service teams to onboard to Azure Security internal services by providing specific configuration settings. The goal of dSCM is to reduce the onboarding and configuration management time for services onboarding to Azure Security services.

**Datacenter Secrets Management Service (dSMS)**: dSMS is an Azure service that handles, stores, and manages the lifecycle for Azure Foundational Services.

**Datacenter Security Token Service (dSTS)**: dSTS provides a highly available and scalable security token service for authenticating and authorizing clients (users and services) of Azure Foundation and Essential Services.

**DataGrid**: DataGrid system is comprised of a metadata repository system to store data contract for all Common Schema events and data ingested from SQL, Azure SQL, Azure Tables, Azure Queues, CSV and TSV files.

**DesktopAnalytics**: DesktopAnalytics provides enterprise customers with device telemetry data to obtain and maintain accurate customer details across Office and Windows.

**MSFT.RR DNS**: MSFT.RR DNS is the Microsoft internal Recursive DNS for internal consumption.

**Dynamics 365 Content Management System (CMS)**: Dynamics 365 Content Management System (CMS) controls the storage platforms, content management system documents and services, and supporting components. The CMS platform also stores and processes binary files (Images, Videos, Files). The core services that comprise CMS are Command (Write, Update, Modify) and Query (Index, Search, Read): both controlling RBAC for entities interacting with the content layer existing on the platform.

**Dynamics 365 Insights Apps AI**: Dynamics 365 Insights Apps AI (formerly B360 AI Platform) provides internal AI services to products built by other teams within Dynamics 365 Insights Apps (formerly Business 360). The Dynamics 365 Insights Apps AI service leverages Microsoft data sources (Search Logs, Browser Logs) and other 1st and 3rd party data to enrich consumer profiles (B2C).

**Dynamics 365 Integrator App:** Dynamics 365 Integrator App is responsible for the sync of data between all Dynamics 365 platforms.

**Enterprise Data Platform**: Enterprise Data Platform is a data pipeline service that collects, analyzes and shares back value add telemetry to Microsoft Enterprise customers.

**Environmental Sustainability Green SKU - Data Platform[12]**: Environmental Sustainability Green SKU - Data Platform provides science-based calculations for carbon emission computation for the Emission Impact Dashboard and Carbon platform.

**ExP - Managed**: ExP - Managed Service is an A/B testing platform which provides Microsoft teams with a tool to easily run A/B experiments.

**ExP Treatment Assignment Service[12]**: ExP Treatment Assignment service provides HTTP REST endpoints for customers to retrieve configuration for A/B testing and exposure control. This includes variants (flights), feature flags (treatment variables), assignment context and the experimentation blob.

**Fabric Controller Fundamental Services:** Fabric Controller Fundamental Services, earlier known as Compute Manager, is an Azure core service responsible for the allocation of Azure tenants and their associated containers (VMs) to the hardware resources in the datacenter, and for the management of their lifecycle. Subcomponents include the Service Manager (SM / Aztec), Tenant Manager, Container Manager and Allocator.

**Falcon**: Falcon is a pseudo-serverless ecosystem that enables teams across Microsoft to build highly scalable microservices powering various features that span across Bing, Skype and Office.

**Gateway Manager**: Gateway Manager is a control plane for VPN, ExpressRoute, Application Gateway, Azure Firewall, and Bastion. It is a critical component in Hybrid Azure Networking.

**Geneva Analytics Orchestration[12]:** The Geneva Analytics Platform (Cloud Analytics Service) includes Data Studio, the Geneva Catalog, Geneva Job Scheduler, Geneva Collector and satellite micro-services. The Geneva Analytics Platform provides tools for Data Discovery, Data Transformations and Data Movement to internal Microsoft Teams. It integrates with other Azure Cloud Engineering Systems: The Geneva Pipeline, IcM, Geneva Health, etc.

**Geneva Actions**: Geneva Actions is an extensible platform enabling compliant management of production services and resources running on the Azure Cloud. It allows users to plug in their own live site operations to the Geneva Actions authorization and auditing system to ensure safe and secure control of the Azure platform.

**Geneva Warm Path**: Geneva Warm Path is a monitoring / diagnostic service used by teams across Microsoft to monitor the health of their service deployments.

**Hybrid Identity Service**: Hybrid Identity Service (HIS) is the backend service for tunneling requests from the cloud to resources on-premises. Current products include Pass-through Authentication, which allows Evolved Security Token Service to authenticate users against Active Directory on-premises.

**IcM Incident Management Service**: IcM is a unified incident management system for all Microsoft services and provides tools for managing live site and on call rotations across the world.

**Interflow**: Interflow is a threat intelligence exchange service. It collects threat data (botnet IPs, hashes of malicious files, etc.) from various Microsoft teams and from various third parties, and then shares that data back out to Microsoft teams so they can act on it in their own products and services.

**JIT**: Just In Time (JIT) access provides engineers temporary elevated access to production services when needed to perform servicing activities and support their services.

**Lens Explorer[12]**: Lens Explorer is part of the Geneva Analytics offering. It allows you to quickly drill down into customer's data and build dashboards that tell them a story.

**MCIO-Reference Systems-Hardware Inventory**: Microsoft Cloud Infrastructure Operations (MCIO)-Reference Systems-Hardware Inventory provides users with information on metadata of physical assets in Cloud Operations and Innovation (CO+I) data centers.

**Microsoft Bot Framework**: Microsoft Bot Framework represents the offline tools, SDKs, CLIs, etc. that support the Azure Bot Service offering.

**Microsoft Email Orchestrator**: Microsoft Email Orchestrator (formerly called Azure Email Orchestrator) is an internal service for managing email content and for sending email communications to customers across Microsoft.

**Microsoft Emissions Impact Dashboard[12]**: The Emissions Impact Dashboard helps Microsoft cloud customers understand, track, report, analyze, and reduce carbon emissions associated with their cloud usage.

**MDM**: MDM (Multi-Dimensional-Metrics) is the component within Geneva Monitoring responsible for collection and aggregation of metrics, performing alerting and visualizing health information.

**MEE Privacy Service**: MEE Privacy Service, also known as Next Generation Privacy Common Infrastructure, is a set of services that provides Data Subject Rights (DSR) distribution and auditing for internal Microsoft GDPR compliance. The service acts as the entry point for all view, export, delete and account close DSR signals that are then fanned out to various agents throughout the company to process in their data sets. Each of those agents then send back completion / acknowledgement signals that are subsequently used to produce several audit reports used to report Microsoft's GDPR compliance to executive management.

**Network Billing**[12]: Network Billing service provides a reliable pipeline with low-latency for services in Azure Networking.

**On-Premises Data Gateway**: On-Premises Data Gateway provides connectivity to on-premises resources for Power BI, Power Apps, and LogicApps services.

**OneBranch Release**: OneBranch Release is the release manager for services to deploy to all clouds in a secure and compliant manner.

**OneDeploy Deployment Infrastructure (DE)**: OneDeploy Development Infrastructure is an Azure Deployment Engine (DE) custom workflow execution for Azure Foundational / Core services.

**OneDS Collector**: OneDS Collector is the ingestion front end for the telemetry pipelines used by Microsoft Windows, Microsoft Office and other Microsoft products. Microsoft products are instrumented with telemetry clients for logging and sending telemetry in the form of events. OneDS Collector validates and scrubs the events, then forwards them to the Asimov Event Forwarder service.

**OneIdentity**: OneIdentity is used for managing user accounts and security groups in different domains.

**PF-FC**[12]: PilotFish Fabric Controller (PF-FC) is the PilotFish hosted environment for managing the underlying hardware and services related to the Azure Fabric Controller. This includes buildout and management of the environments in PF, health of the nodes, FC role management and startup.

**Pilotfish**: Pilotfish is available to first-party customers (e.g., Office 365, Dynamics 365) for the management of hyper-scale services used in high-availability scenarios. Customers are guaranteed a defined level of service health, health monitoring, reporting and alerting, secure communications between servers, secure RDP capability, and full logical and physical machine lifecycle management.

**SIPS ML Detections 2**[12]: SIPS ML Detections 2 service analyzes Azure logs to detect potential attacks compromises, such as account compromise, data breach, web attacks, compromised hosts, against Azure and Azure customers.

**TuringAtAzure**: TuringAtAzure is an API service that allows Microsoft product teams to access Turing language models in their production scenario.

**Unified Remote Scanning (URSA)**: Unified Remote Scanning (URSA) provides a unified and standardized platform for remote security scans across Azure.

**Vulnerability Scanning & Analytics**: Vulnerability Scanning & Analytics is a service that provides vulnerability management and analytics for physical / virtual machines in cloud environments.

**WaNetMon**: WaNetMon monitors the health and availability of the Azure network and its services across all regions and all cloud environments. The platform provides monitoring, alerting and diagnostics capabilities for the Azure networking DRIs to quickly detect and diagnose issues. WaNetMon is also responsible for

democratization of all network telemetry data, getting the data to a common data store and making it accessible for everyone.

**Windows Azure Jumpbox**: Windows Azure Jumpboxes are used by Azure service teams to operate Azure services. Jumpbox (hop-box) servers allow access to and from datacenters. They function as utility servers for runners, deployments, and debugging.

**Workflow**: Workflow lets users upload their workflows to Azure and have them executed in a highly scalable manner. This service is currently consumed only by O365 SharePoint Online service.

### *Microsoft Online Services*

Appsource: Appsource is an enterprise app marketplace which integrates with other major Microsoft platforms including Dynamics and Office to allow an easy click-try-buy process.

Intelligent Recommendations: Intelligent Recommendations enables businesses to automate relevant recommendations, including personalized results for new and returning users, and the ability to interpret both user interactions and item or user metadata. In return, businesses receive tailored recommendations models based on their needs and business logic. Intelligent Recommendations frees companies from the tedious management of editorial collections. Instead, it helps drive engagement, run experiments, and build trust with consumers.

Microsoft 365 Defender: Microsoft 365 Defender is a unified pre- and post-breach enterprise defense suite that natively coordinates detection, prevention, investigation, and response across endpoints, identities, email, and applications to provide integrated protection against sophisticated attacks.

Microsoft Defender for Cloud Apps: Microsoft Defender for Cloud Apps is a comprehensive service that provides customers the ability to extend their on-premise controls to their cloud applications and provide deeper visibility, comprehensive controls, and improved protection for these apps. Microsoft Defender for Cloud Apps provides Shadow IT discovery, information protection to cloud applications, threat detection and in-session controls.

Microsoft Defender for Endpoint: Microsoft Defender for Endpoint is unified platform for preventative protection, post-breach detection, automated investigation, and response. Microsoft Defender for Endpoint protects endpoints from cyber threats, detects advanced attacks and data breaches, automates security incidents, and improves security posture.

Microsoft Defender for Identity: Microsoft Defender for Identity is a cloud-based security solution that leverages on-premises Active Directory (AD) signals to identify, detect, and investigate advanced threats, compromised identities, and malicious insider actions directed at the organization.

Dynamics 365 Customer Voice: Dynamics 365 Customer Voice is a simple yet comprehensive survey solution that builds on the current survey-creation experience of Microsoft Forms in Microsoft 365. It offers new capabilities that make capturing and analyzing customer and employee feedback simpler than ever. Customers can respond to the surveys by using any web browser or mobile device. As responses are submitted, Power BI reports can be used to analyze them and make decisions in real time.

Microsoft Graph: Microsoft Graph exposes multiple APIs from Office 365 and other Microsoft cloud services through a single endpoint. Microsoft Graph simplifies queries that would otherwise be more complex. Customers can use Microsoft Graph and Microsoft Graph Webhooks to:

- Access data from multiple Microsoft cloud services, including Azure Active Directory, Exchange Online as part of Office 365, SharePoint, OneDrive, OneNote, and Planner.
- Navigate between entities and relationships.
- Access intelligence and insights from the Microsoft cloud (for commercial users).

Microsoft Intune: Microsoft Intune provides mobile device management, mobile application management, and PC management capabilities from the cloud. Using Intune, organizations can provide their employees with access to corporate applications, data, and resources from virtually anywhere on almost any device, while helping to keep corporate information secure.

Microsoft Managed Desktop: Microsoft Managed Desktop combines Microsoft 365 Enterprise with an IT-as-a-Service backed by Microsoft, for providing the best user experience, the latest technology as well as Desktop security and IT services, with an end-to-end cloud-based solution that is managed, supported, and monitored by Microsoft.

Microsoft Stream: Microsoft Stream provides a common destination for video management, with built-in intelligence features, and the IT management and security capabilities that businesses of all sizes require. It is a fully managed SaaS service for enterprise customers in which users can upload, share and view videos within a small team, or across an entire organization, all inside a securely managed environment. Microsoft Stream leverages cognitive services that enable in-video face detection and speech-to-text transcription that enhances learning and productivity. Microsoft Stream also includes IT admin capabilities for managing video content and increases engagement within an organization by integrating video into the applications used every day. Microsoft Stream utilizes built-in, industry-leading encryption and authenticated access to ensure videos are shared securely.

Microsoft Threat Experts: Microsoft Threat Experts is a managed threat hunting service that provides Security Operation Centers (SOCs) with expert level monitoring and analysis to help them ensure that critical threats in their unique environments do not get missed.

Nomination Portal: Nomination Portal is an optimized customer relation management solution for Azure On-boarding and Nomination to Engagement Customer Lifecycle. It provides increased transparency on Azure services offered and what the customer is taking to production, a clearer idea of where IPs are needed with improved assignment and activity redecoration, as well as capturing effort towards customer engagements.

PowerApps: PowerApps enables customers to connect to their existing systems and create new data, build apps without writing code, and publish and use the apps on the web and mobile devices. Services under PowerApps include, but are not limited to, the following:

- **PowerApps Authoring Service**: PowerApps Authoring Service is a component service that supports the PowerApps service for authoring cross-platform applications without the need to write code. It provides the service to visually compose the app using a browser, to connect to data using different connections and APIs, and to generate a packaged application that is published to the PowerApps Service. The packaged application can be previewed using the service while authoring or it can be shared and played on iOS, Android and Windows Phone.
- **PowerApps MakerX Portal**: PowerApps MakerX Portal is the management website for PowerApps, where users can sign up for the product and perform management operations on PowerApps and related resources. It communicates directly with the PowerApps Service RP for most operations and provides entry points for users to launch into other PowerApps services as necessary.
- **PowerApps Service RP**: PowerApps Service RP is the back-end RESTful service for PowerApps that handles the management operations for PowerApps and related entities such as connections and APIs. Architecturally, the resource provider (RP) is an ARM RP, meaning that incoming requests are authenticated by the ARM on the front end and proxied through to the RP.

Power Automate: Power Automate helps customers set up automated workflows between their favorite apps and services to synchronize files, get notifications, collect data, and more.

Power BI: Power BI is a suite of business analytics tools to analyze data and share insights. Power BI dashboards provide a 360-degree view for business users with their most important metrics in one place, updated in real time, and available on all of their devices. With one click, users can explore the data behind their dashboard

using intuitive tools that make finding answers easy. Power BI facilitates creation of dashboards with over 50 connections to popular business applications and comes with pre-built dashboards crafted by experts that help customers get up and running quickly. Customers can access their data and reports from anywhere with the Power BI Mobile apps, which update automatically with any changes to customers data.

Power Virtual Agents: Power Virtual Agents is an offering that enables anyone to create powerful chatbots using a guided, no-code graphical interface, without the need for data scientists or developers. It eliminates the gap between subject matter experts and the development teams building the chatbots, and the long latency between subject matter experts recognizing an issue and updating a chatbot to address it. It removes the complexity of exposing teams to the nuances of conversational AI and the need to write complex code. It also minimizes the IT effort required to deploy and maintain a custom conversational solution by empowering subject matter experts and departments to build and maintain their own conversational solutions.

Update Compliance: Update Compliance shows customers the state of their devices with respect to Windows updates so that customers can ensure that they are on the most current updates as appropriate. In addition, Update Compliance provides the following: dedicated drill-downs for devices that might need attention, inventory of devices - including the version of Windows they are running and their update status, ability to track protection and threat status for Windows Defender Antivirus-enabled devices, overview of Windows Update for Business deferral configurations (Windows 10, version 1607 and later), powerful built-in log analytics to create useful custom queries that utilize Windows 10 diagnostic data.

### *Microsoft Dynamics 365*

Chat for Dynamics 365: Chat for Dynamics 365 is one of the primary channels for customers to interact with support agents because of its simplicity and ease of use. Customer service centers prefer customers to connect via Chat for Dynamics 365 because it allows service agents to be more productive by simultaneously engaging with multiple customers.

Dataverse: Dataverse securely stores and manages data that is used by business applications. Data within Dataverse is stored within a set of entities (An entity is a set of records used to store data, similar to how a table stores data within a database). Dataverse includes a base set of standard entities that cover typical scenarios, but also lets the customer create custom entities specific to their organization and populate them with data using Power Query. App makers can then use Power Apps to build rich applications using this data.

Dynamics 365 AI Customer Insights: Dynamics 365 AI Customer Insights is a cloud-based SaaS service that enables organizations of all sizes to bring together data from multiple sources and generate knowledge and insights to build a holistic 360 degree view of their customers.

Dynamics 365 Athena - CDS to Azure Data Lake: Export to Data Lake (Athena) is a pipeline to continuously export data from the Dataverse to Azure Data Lake Gen2. It is designed for enterprise big data analytics, is cost-effective, scalable, has high availability / disaster recover capabilities and enables best in class analytics performance. Data is stored in the Common Data Model format which provides semantic consistency across apps and deployments. The standardized metadata and self-describing data in an Azure Data Lake Gen2 facilitates metadata discovery and interoperability between data producers and consumers such as Power BI, Azure Data Factory, Azure Databricks, and Azure Machine Learning service.

Dynamics 365 Business Central: Dynamics 365 Business Central, formerly known as Dynamics NAV, is Microsoft's Small and Medium Business service built on and for the Azure cloud. It provides organizations with a service that supports their unique requirements and rapidly adjusts to constantly changing business environments, without the additional overhead of managing infrastructure.

Dynamics 365 Business Q&A: Dynamics 365 Business Q&A (BizQA) services are enabled in Dynamics 365 Relevance Search (RS) by default. BizQA provides additional backend features to improve Dynamics 365 Relevance Search. These features include natural language search with Intent understanding, knowledge-based query annotation, semantic parsing to create structured queries, spell checking, query rewriting to normalize

synonyms and abbreviations, and world common knowledge to understand location, date, time, holiday, and popular organizations. Additional features include multi-level ranking and a customer feedback loop which consumes user clicks to train and improve the rankers.

Dynamics 365 Commerce (including Dynamics 365 Retail), Dynamics 365 Finance, and Dynamics 365 Supply Chain Management: These offerings are supported by the same set of underlying services. These offerings provide customers with a complete set of adaptable ERP functionality that includes financials, demand planning, procurement / supply chain, manufacturing, distribution, services industries, public sector and retail capabilities that are combined with BI, infrastructure, compute and database services.

Dynamics 365 Customer Insights Engagement Insights: Dynamics 365 Customer Insights Engagement insights enables customers to understand interactively how their customers are using their services and products - both individually and holistically - on websites, mobile apps, and connected products. Customers can combine behavioral analytics with transactional, demographic, survey, and other data types from Dynamics 365 Customer Insights.

Dynamics 365 Customer Service: Dynamics 365 Customer Service provides tools / apps that help build great customer relationships by focusing on optimum customer satisfaction. It provides many features and tools that organizations can use to manage the services they provide to customers.

Dynamics 365 Customer Service Insights: Dynamics 365 Customer Service Insights gives customers actionable insights into critical performance metrics, operational data, and emerging trends from the customer's customer service system. Built-in dashboards, interactive charts, and visual filters provide views into support operations data across channels, and highlight areas for improvement that can have the greatest impact, helping the customer quickly evaluate and respond to key performance indicators (KPIs) and customer satisfaction levels.

Dynamics 365 Field Service: Dynamics 365 Field Service business application helps organizations deliver onsite service to customer locations. It combines workflow automation, algorithm scheduling, and mobility to help mobile workers fix issues when they are onsite at the customer location.

Dynamics 365 Fraud Protection: Dynamics 365 Fraud Protection provides customers with a payment fraud solution helping e-commerce merchants drive down fraud loss, increase bank acceptance rates to yield higher revenue, and improve the online shopping experience for its customers.

Dynamics 365 Guides: Dynamics 365 Guides is a mixed-reality application for Microsoft HoloLens that lets operators learn, during the flow of work by providing holographic instructions when and where they are needed. These instruction cards are visually tethered to the place where the work must be done, and can include images, videos, and 3D holographic models. Operators see what must be done, and where. Therefore, they can get the job done faster, with fewer errors and greater skill retention.

Dynamics 365 Human Resources: Dynamics 365 Human Resources provides a Microsoft-hosted HR solution that delivers core HR functionality to HR professionals, managers and employees across the organization.

Dynamics 365 Intelligent Order Management: Dynamics 365 Intelligent Order Management enables customers to manage the orchestration of orders through to fulfillment helping organizations orchestrate order flows across different platforms and apps. Intelligent Order Management is designed to operate in complex environments where there are many internal and external systems and partners that enable the supply chain processes. The platform is designed to scale up and down with a business, regardless of the organization size.

Dynamics 365 Marketing: Dynamics 365 Marketing is a marketing-automation application that helps customers turn prospects into business relationships. Dynamics 365 Marketing has built-in intelligence to allow customers create emails and online content to support marketing initiatives, organize and publicize events, and share information.

Power Apps portals: Power Apps portals is where users can log-in and view an aggregated list of their business apps across various partner services including PowerApps.

Dynamics 365 Project Operations: Dynamics 365 Project Operations connects sales, resourcing, project management, and finance teams in a single application to win more deals, accelerate project delivery, and maximize profitability.

Dynamics 365 Remote Assist: Dynamics 365 Remote Assist enables customers to collaborate more efficiently by working together from different locations on HoloLens, HoloLens 2, Android, or iOS devices.

Dynamics 365 Sales: Dynamics 365 Sales enables sales professionals to build strong relationships with their customers, take actions based on insights, and close sales faster. It can be used to keep track of customer accounts and contacts, nurture sales from lead to order, and create sales collateral.

Dynamics 365 Sales Insights: Dynamics 365 Sales Insights empowers sellers to deliver personalized engagement and build profitable relationships. Capabilities include supercharging sales with a prioritized list of everything that needs to be done and optimizing the sales cadence for different types of prospects with sequences.

Dynamics 365 Sales Professional: Dynamics 365 Sales Professional application is a modular app built to provide capabilities tailored for sales professionals and sales managers. As an administrator or customizer, customers can easily customize the entities, dashboards, forms, views, charts, and business processes included in the D365 Sales Professional application using the app designer, without having to write any code.

Dynamics 365 Talent Attract & Onboard: Dynamics 365 Talent includes Attract, which can help customers identify, interview, and hire candidates that hold the skills the organization needs. As customers move from recruiting through hiring, the Onboard app can help customers bring the new employee into the organization by setting accurate expectations, providing information needed to get started, connecting them with colleagues, and set them up for success in their new role.

### *Microsoft Cloud for Financial Services*

Microsoft Cloud for Financial Services: Microsoft Cloud for Financial Services provides capabilities to manage data to deliver differentiated experiences, empower employees, and combat financial crime. It also facilitates security, compliance, and interoperability. This set of cloud-based solutions enhances collaboration, automation, and insights to streamline processes; personalizes every customer interaction; improves customer experience; and delivers rich data insights. The data model enables Microsoft's partners and customers to extend the value of the platform with additional solutions to address the financial industry's most urgent challenges. These capabilities will help organizations align to business and operational needs, and then deploy quickly to accelerate time to value. Microsoft Cloud for Financial Services and its capabilities (Unified Customer Profile, Customer Onboarding, and Collaboration Manager) are built atop Azure, Microsoft Dynamics 365, Microsoft Power Platform, and Microsoft 365 offerings. Microsoft 365 related offerings are not in the scope of this examination.

Unified Customer Profile: Unified Customer Profile helps banks tailor their customer experiences via a 360-degree view of the customer and, bringing together financial, behavioral, and demographic data.

Customer Onboarding: Customer Onboarding provides customers with easy access loan apps and self-service tools, helping to streamline the loan process to enhance customer experience and loyalty while increasing organizational and employee productivity. Helps customers efficiently apply for and keep track of a loan by streamlining the application process. Additionally, it empowers loan officers to manage loan applications with workflow automation, streamlining and customizing operations to meet specific lending needs.

Collaboration Manager: Collaboration Manager helps banks bring collaboration seamlessly into their lending workflows enabling them to improve process orchestration from front office to back office and facilitate omnichannel communications with customers. This capability helps banks improve organization and employee productivity, unlock value creation, and enhance customer experience. The portions of this capability covered by Microsoft 365 are not in scope for this examination.

## Description of Controls

### Security Organization - Information Security Program

Azure has established an Information Security Program that provides documented management direction and support for implementing information security within the Azure environment. The design and implementation of applicable controls are defined based on the type of Azure service and its architecture.

The objective of the Information Security Program is to maintain the Confidentiality, Integrity, and Availability of information while complying with applicable legislative, regulatory, and contractual requirements.

The Information Security Program consists of the following components:

1. Policy, Standards and Procedures
2. Risk Assessment
3. Training and Awareness
4. Security Implementation
5. Review and Compliance
6. Management Reporting

The Information Security Program is based on the International Organization of Standards (ISO) Codes of Practice for information security management ISO / IEC27001:2013 standard. Its accompanying policies and processes provide a framework to assess risks to the Azure environment, develop mitigating strategies and implement security controls, define roles and responsibilities (including qualification requirements), coordination of different corporate departments and implement security controls based on corporate, legal and regulatory requirements. In addition, team specific Standard Operating Procedures (SOPs) are developed to provide implementation details for carrying out specific operational tasks in the following areas:

1. Access Control
2. Anti-Malware
3. Asset Management
4. Baseline Configuration
5. Business Continuity and Disaster Recovery
6. Capacity Management
7. Cryptographic Controls
8. Datacenter Operations
9. Document and Records Management
10. Exception Process
11. Hardware Change and Release Management
12. Incident Management
13. Legal and Regulatory Compliance
14. Logging and Monitoring
15. Network Security
16. Penetration Testing

17. Personnel Screening
18. Privacy
19. Risk Management
20. Security Development Lifecycle
21. Software Change and Release Management
22. Third Party Management
23. Training and Awareness
24. Vulnerability Scanning and Patch Management

### *Microsoft Security Policy*

Microsoft Security Policy outlines the high-level objectives related to information security, defines risk management requirements and information security roles and responsibilities. The Security Policy contains rules and requirements that are met by Azure and other Online Services staff in the delivery and operations of the Online Services environment. The Security Policy and Objectives are derived from the ISO / IEC 27001:2013 standard and is augmented to address relevant regulatory and industry requirements for the Online Services environment.

The policy is reviewed and updated, as necessary, at least annually, or more frequently, in case of a significant security event, or upon significant changes to the service or business model, legal requirements, organization or platform.

Each management-endorsed version of the Microsoft Security Policy and all subsequent updates are distributed to all relevant stakeholders from the Microsoft intranet site.

### *Roles and Responsibilities*

Information security roles and responsibilities have been defined across the different Azure functions. The Cloud + AI Security team facilitates implementation of security controls and provides security guidance to the teams. The Global Ecosystem and Compliance team also coordinates with representatives from CELA (including leads of IT and Security), Human Resources (personnel security), and Microsoft Online Services (security policy requirements) on additional information security related activities impacting the services.

### *Personnel*

Microsoft performs employee background screening as determined by the hiring manager based on access to sensitive data, including access to personally identifiable information or to back-end computing assets and per customer requirements, as applicable. Microsoft also employs a formal performance review process to ensure employees adequately meet the responsibilities of their position, including adherence to company policies, information security policies, and workplace rules. Hiring managers may, at their discretion, initiate corrective actions, up to and including immediate termination, if any aspect of an employee's performance and conduct is not satisfactory.

The Microsoft Online Services Delivery Platform Group works with Microsoft Human Resources and vendor companies to perform the required background check on each new or transferred personnel before they are granted access to the Microsoft Online Services production assets containing customer data.

Corporate policies are communicated to employees and relevant external parties during the onboarding process and as part of the annual security training and awareness education program. Non-disclosure Agreements

(NDAs) are signed by employees and relevant external parties upon engagement with Microsoft. Disciplinary actions are defined for persons who violate the Microsoft Security Policy or commit a security breach. Employees are also required to comply with relevant laws, regulations and provisions regarding information security remain valid if the area of responsibility changes or the employment relationship is terminated. Security Policy and non-disclosure requirements are reviewed periodically to validate appropriate protection of information.

### *Training and Awareness*

Information security training and awareness is provided to Azure employees, contractors and third parties on an ongoing basis to educate them on applicable policies, standards and information security practices. Awareness training on security, availability and confidentiality of information is provided to employees at the time of joining as part of induction. In addition, all staff participate in a mandatory security, compliance, and privacy training periodically in order to design, build and operate secure cloud services.

Employees receive information security training and awareness through different programs such as new employee orientation, computer-based training, and periodic communication (e.g., compliance program updates). These include training and awareness pertaining to the platform, in the security, availability, confidentiality, and integrity domains. In addition, job-specific training is provided to personnel, where appropriate. The key objectives of the information security training and awareness program are listed below:

| | |
|---|---|
| **Objective 1** | The learner will be able to articulate the need to protect confidentiality, integrity, and availability of the production environment. |
| **Objective 2** | The learner will be able to apply basic security practices to safeguard and handle the production environment and customer information. |
| **Objective 3** | The learner will understand the criticality of security, compliance and privacy in relation to customer expectations. |
| **Objective 4** | The learner will have a basic understanding of the responsibility to meet compliance and privacy commitments. |
| **Objective 5** | The learner will know where to find additional information on security, privacy, business continuity / disaster recovery and compliance. |

All Engineering staff are required to complete a computer-based training module when they join the team. Staff are required to retake this training at least once per fiscal year.

In addition, annual SBC training is mandatory for all Microsoft employees. The SBC training includes an anti-corruption section that focuses on Microsoft's anti-corruption policies and highlights policies that reinforce the need for employees to work with integrity and to comply with the anti-corruption laws of the countries in which Microsoft operates. All active employees are required to complete this course.

### *Information System Review*

Azure performs a periodic Information Security Management System (ISMS) review and results are reviewed with the management. ISMS documents cover scope, declaration of applicability and the results of the last management review. This involves monitoring ongoing effectiveness and improvement of the ISMS control

environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.

### *Compliance Requirements*

Azure maintains reasonable and appropriate technical and organizational measures, internal controls, and information security routines intended to help protect customer data against accidental loss, destruction, or alteration; unauthorized disclosure or access; or unlawful destruction.

Azure compliance requirements are monitored and reviewed regularly with CELA and other internal organizations, as applicable. Members of the Global Ecosystem and Compliance, and Cloud + AI Security teams update relevant SOPs, Security Policy and service descriptions in order to remain in-line with compliance requirements.

The Security Policy requires a periodic review of the performance of policies and procedures governing information security. The Global Ecosystem and Compliance team coordinates independent third party audits (internal and external) which evaluate systems and control owners for compliance with security policies, standards, and other requirements. Audit activities are planned and agreed upon in advance by stakeholders, including approval for necessary read access required to perform such audits to avoid impacting the overall availability of the service. External independent audits are performed at least annually and any findings are prioritized and tracked to resolution.

### *Risk Management*

Azure has developed and documented a risk assessment policy to address the purpose, scope, roles, and responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.

Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., CELA, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. The list of reviewed suppliers is maintained and their risk profiles are reviewed at least annually.

## Operator Access

### *Production Infrastructure Access Management*

**Identity and Access Management (Microsoft Personnel)**

The Security Policy establishes the access control requirements for requesting and provisioning user access for accounts and services. The policy requires that access be denied by default, follow least privilege principle, and be granted only upon business need.

Azure uses a specific corporate AD infrastructure for centralized authentication and authorization to restrict access to the systems and services within the Azure environment. Each user account is unique and is identifiable to an individual user.

Domain-account management requests are routed to the designated asset owner or associated agent according to established account provisioning and de-provisioning processes for approval. Typically, access is controlled through addition of individual user accounts to established domain security groups within the AD. Based on the configuration of a security group, any access request may either require explicit approval from the assigned

security group owner or may be auto-approved for members of designated teams within Azure's organizational structure. Requests requiring explicit approval are automatically forwarded to the security group owner for approval in the system. In addition, Azure Government access requires explicit approval with required screening to confirm US citizenship of the user that is requesting access.

Employee status data from Microsoft HR is used to facilitate the provisioning and removal of user accounts in Azure-managed AD domains. Automated feeds from Microsoft HR systems provide this information, and account management processes prevent the creation of an account for individuals that do not have valid HR records. These feeds also initiate the removal of the user accounts for terminated users from the AD.

Automated mechanisms have been implemented to manage the appropriateness of access granted to information systems. Manual periodic reviews of individual accounts and security group memberships on assets are performed by authorized individuals, as appropriate, to evaluate whether access is still required. Remediation action is taken, as necessary, based on the review.

Policies and standards have been established and implemented to enforce appropriate user account password expiration, length, complexity, and history. Multi-factor authentication is enforced for production domains that do not require password-based authentication. Azure personnel are required to follow the Microsoft password policy for applicable domains as well as local user accounts for all assets. Additionally, domain user accounts, if inactive for more than 90 days, are suspended until the appropriateness of continued access for these accounts is resolved. If no action is taken by the user to reenable the suspended account, after 15 days the account is deleted.

**Access to Azure Components**

Access to the Azure components (e.g., Fabric, Storage, Subscriptions, and Network Devices) in the production environment is controlled through a designated set of access points and restricted to the corresponding service Production Support and Engineering teams. Access points such as Secure Admin Workstation (SAW) require users to perform two-factor authentication using a smart card and AD domain credentials to gain access. Access to network devices in the scope boundary requires two-factor authentication. Passwords used to access Azure network devices are restricted to authorized individuals and system processes based on job responsibilities and are changed on a periodic basis. Mobile devices connected to the production environment are limited to Secure Access Workstation (SAW) laptops and do not include phones or tablet.

In the unlikely event where JIT temporary access cannot be used, Azure service teams have the ability to access the production environment using designated break-glass accounts which provide user a short-term admin level access. Alerting and monitoring has been enabled for all break-glass accounts access. Upon accessing a break-glass account an alert is generated, whereupon the service team will investigate and determine if the access was appropriate.

Production assets that are not domain-joined or require local user accounts for authentication, require unique identifiers tied to individual user that requires appropriate approvals prior to being granted access. Non-domain-joined user accounts, that are not required due to termination of user or change in user's role and responsibilities, are removed manually within a stipulated period of termination / role change. In addition, access through persistent interactive local accounts on servers are not considered within user access review as they are configured to raise security alert upon creations and are created on isolated VMs which tend to have a short life span.

**Packet Filtering**

Azure has implemented filtering platform with rule sets and guards to ascertain that the untrusted VMs cannot generate spoofed traffic, cannot receive traffic not addressed to them, cannot direct traffic to protected infrastructure endpoints, and cannot send or receive inappropriate broadcast traffic.

VM based switch is designed and implemented through the filtering platform with Address Resolution Protocol (ARP) guards / rules to defend against ARP spoofing and related attacks. The guards / rules can be enabled on a per port basis to verify the sender's Media Access Control (MAC) Address and IP address to prevent spoofing of outgoing ARP packets, and only allow inbound ARP packets to reach a VM if they are targeted at that VM's IP address.

Storage nodes run only Azure-provided code and configuration, and access control is thus narrowly tailored to permit legitimate customer, applications, and administrative access only.

**Virtual Local Area Network Isolation**

Virtual Local Area Networks (VLANs) are used to isolate FC and other devices. VLANs partition a network such that no communication is possible between VLANs without passing through a router.

The Azure network in any datacenter is logically segregated into the Fabric core VLAN that contains trusted FCs and supporting systems and a VLAN that houses the rest of the components including the customer VMs.

**Platform Secrets**

Platform secrets, including certificates, keys, and Storage Account Keys (SAKs) are used for internal communication and are managed in a secure store that is restricted to authorized Azure personnel.

### *Access to Customer Virtual Machines by Azure Personnel*

By default, user accounts are not created, and the Windows default administrator account is disabled on customer PaaS VMs. However, access to the customer VMs may be required for exceptional situations such as troubleshooting issues and handling incidents. In order to resolve these types of issues, temporary access procedures have been established to provide temporary access for Azure personnel to customer data and applications with the appropriate approvals. These temporary access events (i.e., request, approval and revocation of access) are logged and tracked using an internal ticketing system per documented procedures.

**Network Device Remote Access**

Azure network device access is provided through TACACS+ and local accounts, and follows standard logical access procedures as established by the Azure Networking team.

### *Directory and Organizational Identity Services Access Management*

**Customer Authentication Credentials**

Each online customer is assigned a unique identity. Appropriate password hashing algorithms are in place to ensure that the authentication credential data stored is protected and is unique to a customer.

**Remote Desktop**

Production servers are configured to authenticate via AD. Directory and Organizational Identity Services' production servers require users to perform two-factor authentication using a smart card and domain password to gain access to the Microsoft Directory Store production servers using the Remote Desktop Connection application. Remote Desktop Connection has encryption settings enforced. These settings are controlled using the domain group policy within the production servers. The settings enforce remote desktop connections made to the production server to be encrypted.

## Data Security

### *Data Classification and Confidentiality Policy*

Data (also referred to as information and asset) is classified into eleven categories, as described in the Data section above, based on how it is used or may be used within the Service environment.

There is one other type of data which is sometimes referenced in relation to data classification and protection. Azure does not treat this as a single category. Instead, it may contain data from one or more data classes described in the Data section above.

- **Personally Identifiable Information (PII):** Any data that can identify an individual is PII. Within Azure, PII of Azure subscription / tenant administrators (direct customers) is treated differently from the PII of end-users of services hosted in Azure. This is because in order to provide the Azure service, access to Administrator PII is needed, such as in the event of outage related notifications.

### *Cryptographic Controls*

Cryptographic controls and approved algorithms are used for information protection within the Azure platform and implemented based on the Azure Cryptographic Policy and Microsoft Cryptographic Standards. Cryptographic keys are managed throughout their lifecycle (e.g., ownership, generation, storage, distribution, periodic rotation and revocation) in accordance with established key management procedures. Access to cryptographic keys is restricted through security groups membership and use of JIT.

### *Backup*

Processes have been implemented for the backup of critical Azure components and data. Backups are managed by the Azure Data Protection Services (DPS) team and scheduled on a regular frequency established by the respective component teams. The DPS team monitors backup processes for failures and resolves them per documented procedures to meet required backup frequency and retention. Azure teams that support the services and the backup process conducts integrity checks through standard restoration activities. Further, production data is encrypted on backup media.

Backup restorations are performed periodically by appropriate individuals. Results of the test are captured and any findings are tracked to resolution.

Offsite backups are tracked and managed to maintain accuracy of the inventory information. Azure is moving from offsite tape-based storage solutions to use of storage accounts in regions or locations different from the primary data location.

Access to backup data follows the same procedures defined under the Operator Access section above.

### *Data Protection Services*

The DPS group has implemented a secure backup system infrastructure to provide secure backup, retention, and restoration of data in the Microsoft Online Services environment. Data is encrypted prior to backup and in transit where applicable, and can be stored on tape, disk, or Storage accounts based on the service requirements.

### *Data Redundancy and Replication*

Azure Storage provides data redundancy to minimize disruptions to the availability of customer data. The data redundancy is achieved through fragmentation of data into extents which are copied onto multiple nodes within a region. This approach minimizes the impact of isolated Storage node failures and loss of data.

Critical Azure components that support delivery of customer services have been designed to maintain high availability through redundancy and automatic failover to another instance with minimal disruption to customer services. Agents on each VM monitor the health of the VM. If the agent fails to respond, the FC reboots the VM. In case of hardware failure, the FC moves the role instance to a new hardware node and reprograms the network configuration for the service role instances to restore the service to full availability.

Customers can also leverage the geographically distributed nature of the Azure infrastructure by creating a second Storage account to provide hot-failover capability. In such a scenario, customers may create custom roles to replicate and synchronize data between Microsoft facilities. Customers may also write customized roles to extract data from Storage for offsite private backups.

Data is backed up to a region or location different from the primary data location and retained as per the retention policy.

Azure Storage maintains three replicas of customer data in blobs, tables, queues, files, and disks across three separate fault domains in the primary region. Customers can choose to enable geo-redundant storage, in which case three additional replicas of that same data will be kept also across separate fault domains in the paired region within the same geography. Examples of Azure Regions are North and South US or North and West Europe. These regions are separated by several hundred miles. Geo-replication provides additional data durability in case of a region wide disaster. For Azure Government, the geo-replication is limited to regions within the United States.

For Azure SQL that relies on Service Fabric, there are a minimum of three replicas of each database - one primary and two secondary replicas. If any component fails on the primary replica, Azure SQL detects the failure and fails over to the secondary replica. In case of a physical loss of the replica, Azure SQL creates a new replica automatically.

All critical platform metadata is backed up in an alternate region several hundred miles from the primary copy. Backup methods vary by service and include Azure Storage geo-replication, Azure SQL geo-replication, service-specific backup processes, and backup to tape. Azure manages and maintains all backup infrastructure.

### *Data Segregation*

Directory Services assigns each tenant a unique identifier as part of the Active Directory. The mapping between the tenant and the AD location is represented within the partition table and is hidden from each customer tenant. Each tenant is segregated and partitioned within AD forest(s) based on this unique identifier to ensure appropriate customer data segregation.

### *Customer Data Deletion*

Customer data is retained in the Online Service in a limited function account for 90 days after expiration or termination of customer's subscription so that the customer may extract the data. After the 90 day retention period ends, the customer's account is disabled and the customer's data is deleted. In accordance with applicable retention policies and legal / regulatory requirements as described in the Customer Registration section of the subscription, customer data is securely disposed of upon customer instruction. Hard disk and offsite backup tape destruction guidelines have been established for appropriate disposal. Customer accounts in non-payment or in violation of terms, etc., are subject to involuntary terminations and account disablement.

### *Platform Communication and Customer Secrets Protection*

Data integrity is a key component of the Azure Platform. Customer secrets such as Storage Account Keys are encrypted during storage and transit. The customer facing portals and APIs only allow access to the Azure platform over a secure channel based on the service.

**Azure Platform Communication**

Internal communication between key Azure components where customer data is transmitted and involved is secured using SSL and TLS. SSL and TLS certificates are self-signed, except for those certificates that are used for connections from outside the Azure network (including the Storage service and the FC). These certificates are issued by a Microsoft Certificate Authority. Customer data is transmitted over a secure channel to the Azure platform services.

**Customer Secrets**

Customer secrets, including certificates, private keys, RDP passwords and SAKs are communicated through the SMAPI via the REST protocol, or Azure Portal over a secured channel using SSL. Customer secrets are stored in an encrypted form in Azure Storage accounts. Customer secrets are only known to the customer. Further, private root keys belonging to Azure services are protected from unauthorized access.

**Access Control Service Namespace**

Customers interact with the Access Control Service namespace over the web and service endpoints. Access Control Service namespace is only accessible through HTTPS and uses SSL to encrypt transmission of customer secrets including cryptographic keys, passwords and certificates over external networks. The customer information transmitted to all the Access Control Service endpoints is encrypted over external networks.

## Change Management

The Change Management process has been established to plan, schedule, approve, apply, distribute, and track changes to the production environment through designated responsibilities with the objective of minimizing risk and customer impact. It further controls the integrity and reliability of the environment while maintaining the pace of change required for business purposes.

### *Separation of Environments*

Azure has implemented segregated environments for development, test and production, as a means to support segregation of duties and prevent unauthorized changes to production. Azure maintains logical and / or physical separation between the DEV (development), TEST (pre-production) and PROD (production) environments. Virtual services run on different clusters in separate network segments. TEST and PROD environments reside in separate network segments, which are accessed through distinct TEST and PROD Jumpboxes. Access to TEST and PROD Jumpboxes is restricted to authorized personnel from the service Operations and Production Support teams.

Deployment of software to production must meet testing and operational readiness criteria at each pre-production and production stage, and be approved prior to release. Production deployments use approved software builds and images.

In addition, production data is not used or copied to non-production environments. Test scripts and synthetic data are created for use in the development and test environments.

### *Segregation of Duties*

Segregation of duties is established on critical functions within the Azure environment, to minimize the risk of unauthorized changes to production systems. Responsibilities for requesting, approving and implementing changes to the Azure environment are segregated among designated teams.

### *Software and Configuration Changes*

Software and configuration changes within Azure, including major releases, minor releases and hot fixes, are managed through a formal change and release management procedure, and tracked using a centralized ticketing system. The categorization of these changes is based on priority and risk associated with the change. Changes are requested, approved, tracked and implemented throughout the release lifecycle, which includes product and engineering planning, release management, deployment and post-deployment support phases. Change requests are documented, assessed for their risks and evaluated / approved for acceptance by the designated Azure personnel. Software releases are discussed, planned, and approved through the daily coordinated meetings with appropriate representatives from the service and component teams.

Changes that are made to the source code are controlled through an internal source code repository. Refer to the Secure Development section for the controls enforced on the source code.

Formal security and quality assurance testing is performed prior to the software release through each pre-production environment (i.e., development and stage) based on defined acceptance criteria. The results of the quality assurance testing are reviewed and approved by the appropriate representatives prior to moving the release to production. For changes being deployed to the sovereign clouds, the change is tested in an Azure pre-production environment which is then deployed to the sovereign cloud production environment by the sovereign cloud data custodian after obtaining an additional approval from the sovereign cloud operator(s). Changes are reviewed for their adherence to established change and release management procedures prior to closure. Once deployed, changes are monitored for success; failed implementations are immediately rolled back and the change is not considered as completed until it is implemented and validated to operate as intended.

All activity performed, including changes made, using a user's break-glass account is logged and alerted. Service teams will review activity to ensure any changes made were appropriate.

Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.

### *Hardware Changes*

Hardware changes are managed through formal change and release management procedures and a centralized ticketing system. Hardware changes are evaluated against the release entrance criteria that are established by the Azure Build-Out team, which forms the acceptance criteria for build-out of hardware within the Azure environment. Similar to software changes, the infrastructure changes are discussed and planned through the daily coordinated meetings with representatives from service and component teams.

The Azure Build-Out team coordinates scheduling of the release and deployment of the change into the production environment. The Azure Build-Out team performs the build-out of hardware devices and post build-out validation in coordination with the Azure Deployment Engineering team to verify its adherence to the hardware build requirements for new clusters. Azure Operations Managers perform final review and sign off of new deployments and Azure Build-Out team closes the ticket.

### *Network Changes*

The Azure teams have implemented a formal change management process and centralized ticketing tool to document network changes and their approvals. Network changes include configuration changes, emergency changes, ACLs changes, patches, and new deployments.

ACL changes, that are identified and categorized as a standard change, are considered as pre-approved and may be implemented on peer review. Non-standard changes are reviewed for their characteristics and risks, and approved by representatives from the Cloud + AI Security and Networking teams, during the daily

coordinated meeting. Reviews and approvals are also tracked in a centralized ticketing system. Changes are performed through approved change implementers that are part of a designated security group. Post-implementation reviews are performed by qualified individuals, other than the implementer, who evaluate the change success criteria.

## Software Development

### *Secure Development*

Azure's software development practices, across each of the component teams, are aligned with the Microsoft SDL methodology. The SDL introduces security and privacy control specifications during the feature / component design and throughout the development process, which are reviewed through designated security roles. Azure service teams track and complete their SDL compliance twice a year.

The Cloud + AI Security team creates the SDL baseline for Azure services to follow. The SDL baseline includes tasks to be performed which identify tools or processes that ensure teams are developing their services in a secured manner. As part of onboarding onto the SDL process, the Cloud + AI Security team works with the service teams to determine any additional SDL steps to be performed specific to the service. Additionally, teams are required to perform threat modeling exercises which are reviewed and approved by the Cloud + AI Security team. Each team has an SDL Owner who is responsible for ensuring appropriate completion of the SDL tasks. The SDL Owner reviews the SDL tasks and gives the overall sign off for completion of the SDL process.

Authorized system changes are promoted from test, pre-production and production per the software change and release management process as described in the Change Management section.

### *Source Code Control*

The Azure source code is stored within Azure's internal source code repository tools that function as the versioning system for the source code. The tools track the identity of the person who checks source code out, and what changes are made. Permission to make changes to the source code is provided by granting write access to the source code branches, which limits the access to confined project boundaries per job responsibilities. In addition, source code builds are scanned for malware prior to production release.

Access requests by full-time employees (FTEs) and non-FTEs to the source code repository require approval from the relevant project sponsor. Upon expiry, FTEs and non-FTEs need to submit access request to the project sponsor for renewal.

## Vulnerability Management

### *Logging and Monitoring*

The Cloud + AI Security team has implemented agent-based monitoring infrastructure or custom script-based monitoring within the Azure environment to provide automated logging and alerting capabilities. The logging solutions are enabled on all production systems. The monitoring system detects potential unauthorized activity and security events such as the creation of unauthorized local users, local groups, drivers, services, or IP configurations. The monitoring agents are responsible for monitoring a defined set of user and administrator events, aggregating log events and sending the aggregated abnormal log information to a centralized log repository either at regular intervals or in real-time.

Azure has implemented an Immutable Log engine within the Geneva Monitoring platform to help ensure the integrity of security logs stored at rest with minimal risk of the data being deleted or modified. This is achieved through a configuration policy that defines which security events are considered immutable (cannot be deleted

or modified) and the number of days logs are retained (in immutable state) prior to deletion. Azure has also implemented automated processes to detect instances where immutability has not been configured and sends alerts notifying the service teams to take corrective action.

Component teams (e.g., Fabric and Storage) determine the specific events that need to be captured in consideration with a baseline. Administrator, operator, and system activities performed, such as logon / logoff within the Azure environment, are logged and monitored. As such, Azure components are configured to use Coordinated Universal Time (UTC) time and the clocks are synchronized with the domain controller server.

For network devices, the Azure Networking team monitors, logs, and reports on critical / suspicious activities and deviations from established baseline security configuration for the network devices. Predefined events are reported, tracked, and followed up on and security data is available for forensic investigations. The logs are retained centrally for forensic related analysis and access to the logs follows the same procedures defined under Operator Access section above.

The Cloud + AI Security team has implemented an alerting system to provide real-time alerting through automatic generation of emails and alarms based on the log information captured by the monitoring infrastructure. Component teams are responsible for configuring the events to be alerted. The event and warning logs are routinely examined for anomalous behavior and when necessary, appropriate actions are taken in accordance with the incident handling procedures described in the Incident Management section. The Cyber Defense Operations Center (CDOC), Azure Live Site, and component teams manage response to malicious events, including escalation to and engaging specialized support groups. In addition, the CDOC interacts and communicates with relevant external parties to stay up-to-date and share current threat scenarios and countermeasures.

Azure provides logging mechanisms that can be configured by customers to log activities and performance metrics related to their resources.

### *System Monitoring Tools*

1. Geneva Monitoring within the Azure platform provides automated centralized logging and alerting capabilities for monitoring system use and detection of potential unauthorized activity. The Geneva Monitoring capabilities include Data Collection, Data Aggregation, Data Analysis and Information Access.

2. Alert and Incident Management System (IcM) provides alerting on a real-time basis by automatically generating emails and incident tickets based on the log information captured in Geneva Monitoring.

3. Azure Security Monitoring (ASM) provides logging and alerting capabilities upon detection of breaches or attempts to breach Azure platform trust boundaries. Critical security event logs generated are configured to alert through IcM. ASM monitors key security parameters to identify potentially malicious activity on Azure nodes.

4. Microsoft Endpoint Protection (MEP) guards against malware and helps improve security of the Azure PaaS Guest customers, Azure infrastructure tenants and Azure internal applications. MEP can be configured to enable antimalware protection for the Azure infrastructure tenants and Azure PaaS Guest VMs. Microsoft's antimalware endpoint solutions are designed to run quietly in the background without requiring human intervention. If malware is detected, the endpoint protection agent automatically takes action to remove the detected threat.

5. System Center Endpoint Protection (SCEP) guards against malware and helps improve security for Azure IaaS and physical servers. SCEP solution is designed to run in the background and check for updates at least daily without requiring human intervention. If malware is detected, the endpoint protection agent automatically takes action to remove the detected threat.

6. ClamAV is implemented to monitor for malicious software in the Linux based server environment. ClamAV performs at least daily checks for updates. If malware is detected, the endpoint protection agent automatically takes action to remove the detected threat.

7. Windows Defender guards against malware and helps improve security of the Azure PaaS, IaaS, and physical servers running Windows Server 2016 and newer. Windows Defender can be configured to enable antimalware protection for the Azure infrastructure tenants and Azure PaaS Guest VMs. Microsoft's antimalware solutions are designed to run quietly in the background without requiring human intervention. If malware is detected, the Windows Defender automatically takes action to remove the detected threat.

In addition, the Azure Live Site team uses third-party external monitoring services to monitor service health and performance (including the logging and monitoring tools).

### *Network Monitoring*

The Networking team maintains a logging infrastructure and monitoring processes for network devices. In addition, the Azure Live Site team uses WaNetMon and third-party external monitoring services to monitor network connectivity. In addition, OneDDoS service is implemented on the Azure network to detect and respond to network-based attacks.

### *Vulnerability Scanning*

Cloud + AI Security team carries out frequent internal and external scans to identify vulnerabilities and assess the effectiveness of the patch management process. Services are scanned for known vulnerabilities; new services are added to the next timed quarterly scan, based on their date of inclusion, and follow at least a quarterly scanning schedule thereafter. These scans are used to ensure compliance with baseline configuration templates, validate that relevant patches are installed and identify vulnerabilities. The scanning reports are reviewed by appropriate personnel and remediation efforts are conducted in a timely manner.

### *Patching*

The service and component teams are notified by the Microsoft Security Response Center (MSRC) upon identification of technical vulnerabilities applicable to the Azure Windows-based systems. Azure works with MSRC to evaluate patch releases and determine applicability and impact to Azure and other Microsoft Online Services environments and customers. For Linux based systems, the Ubuntu Security Notices for Linux patches are relied upon as the primary source. The applicable security patches are applied immediately or during a scheduled release to the Azure environment based on the severity of the vulnerability.

Processes are in place to evaluate patches and their applicability to the Azure environment. Once patches have been reviewed and their criticality level determined, service teams determine the release cadence for implementing patches without service disruption.

Applicable patches are automatically applied to Guest PaaS VMs unless the customer has configured the VM for manual upgrades. In this case, the customer is responsible for applying patches.

Teams follow a change process to modify the underlying OS within the platform. All changes are reviewed and tested, at a minimum, for their quality, performance, impact on other systems, recovery objectives and security features before they are moved into production using a defined release process. Test windows have been established for reviewing and testing of new features, and changes to existing features and patches.

Patches are released through the periodic OS release cycle in accordance with change and release management procedures. Emergency out-of-band security patches (e.g., Software Security Incident Response Process patches) are expedited for more immediate release.

### *Securing Edge Sites*

All drives and operating systems used for production servers that reside in edge locations are encrypted. The drives have 'Always On' encryption and stay encrypted even during OS patching and updates. In addition, all unused IO ports on production servers that reside in edge locations are disabled by OS-level configurations that are defined in the baseline security configuration. Continuous configuration validation checks are enabled to detect drift in the OS-level configurations.

In addition, intrusion detection switches are enabled to detect physical access of the device. An alert is sent to an operator and the affected servers are shut down and its secrets are revoked. The alerting and tracking follows the incident response process as defined below.

### *Penetration Testing*

Penetration Testing (PEN Test) is performed at least annually on the Azure environment by an independent third party. The PEN Test scope is determined based on Azure's areas of risk and compliance requirements. PEN Test findings are remediated based on criticality.

## Incident Management

Azure has implemented an incident management framework that includes defined processes, roles, communications, responsibilities and procedures for detection, escalation and response to incidents internally and to customers. Azure reviews the vulnerability and incident management standard operating procedures annually. Azure reviews the implementation of these procedures as part of their internal monitoring and changes are made as often as needed to support continuous improvement of these processes and procedures.

### *Security Incident - Internal Monitoring and Communication*

Azure has established incident response procedures and centralized tracking tools which consist of different channels for reporting production system incidents and weaknesses. Automated mechanisms include system monitoring processes for alerting the Azure Live Site, CDOC, and service On-Call teams per defined and configured event, threshold or metric triggers. Incidents may also be reported via email by different Azure or Microsoft groups such as the service and component teams, Azure Support team or datacenter teams. Users are made aware of their responsibilities of reporting incidents that shall be looked into without any negative consequences. The Azure Live Site, CDOC, and service On-Call teams provide 24x7 event / incident monitoring and response services. The teams assess the health of various components of Azure and datacenters, along with access to detailed information when issues are discovered. Processes are in place to enable temporary access to customer VMs. Access is only granted during, and for the duration of, a specific incident.

Additionally, CDOC conducts yearly tests of the Incident Management SOPs and response capabilities. Reports related to information security events are provided to Azure management on a quarterly basis. Problem statements for systemic issues are submitted to Information Security Management Forum for executive leadership review.

### *Incident Handling*

Azure teams use the established incident classification, escalation and notification process for assessing an incident's criticality and severity, and accordingly escalating to the appropriate groups for timely action. The Azure Live Site and CDOC teams, with assistance from additional Azure teams (e.g., Cloud + AI Security team, component teams for investigation, when necessary), document, track, and coordinate response to incidents. Where required, security incidents are escalated to the privacy, legal or executive management team(s) following established forensic procedures to support potential legal action after an information security incident.

### *Incident Post-Mortem*

Post-mortem activities are conducted for customer impacting incidents or incidents with high severity ratings (i.e., levels 0 and 1). The post-mortems are reviewed by the Azure Operations Management team during weekly and monthly review meetings with Azure senior management. Incident and security post-mortem trends are reviewed and evaluated on a periodic basis and, where necessary, the Azure platform or security program may be updated to incorporate improvements identified as a result of incidents.

### *Network Problem Management*

The Networking team comprises Problem Management, Network Escalations, and Network Security teams to identify and address security alerts and incidents. The Networking team is responsible for identifying and analyzing potential problems and issues in the Microsoft Online Services networking environment.

## Physical and Environmental Security

### *Datacenter Services*

The Datacenter Management team has overall responsibility for the oversight of datacenter operations, including physical security, site services (server deployments and break-fix work), infrastructure build-out, critical environment operations and maintenance, and facilities management. Site Security Officers are responsible for monitoring the physical security of the facility 24x7x365.

Third-party vendors may perform various services in a Microsoft datacenter. For example:

- Mission critical vendors may be responsible for maintaining the datacenter's critical environment equipment.
- Security vendors may manage the site security guard force.
- General facilities management vendors may be responsible for minor building-related services, such as telephones, network, cleaning, trash removal, painting, doors, and locks.
- Site Services may support the Microsoft Online Services operations.

Datacenter Physical Security Management reviews and approves the incident response procedure on a yearly basis. The security incident response procedure details the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses.

### *Physical Security*

Main access to the datacenter facilities are typically restricted to a single point of entry that is manned by security personnel. The main interior or reception areas have electronic card access control devices on the perimeter door(s), which restrict access to the interior facilities. Rooms within the Microsoft datacenters that contain critical systems (servers, generators, electrical panels, network equipment, etc.) are restricted through various security mechanisms, such as electronic card access control, keyed lock on each individual door, man traps, and / or biometric devices.

### *Access Controls*

The Datacenter Management team has implemented operational procedures to restrict physical access to only authorized employees, contractors, and visitors. Temporary or permanent access requests are tracked using a ticketing system. Badges are either issued or activated for personnel requiring access after verification of identification. The Datacenter Management team is responsible for reviewing datacenter access on a regular basis and for conducting a quarterly audit to verify individual access is still required.

### *Datacenter Security Personnel*

Security personnel in the datacenter conduct the following activities for various datacenter facilities:

1. Man the security desks located at the main entrance of the datacenter
2. Conduct periodic inspections of the datacenter through walkthroughs
3. Respond to fire alarms and safety issues
4. Dispatch security personnel to assist service requests and emergencies
5. Provide Datacenter Management team with periodic updates about security events and entry logs
6. Operate and monitor datacenter surveillance systems

### *Security Surveillance*

Datacenter surveillance systems monitor critical datacenter areas like datacenter main entry / exit, datacenter co-locations entry / exit, cages, locked cabinets, aisle ways, shipping and receiving areas, critical environments, perimeter doors, and parking areas. Surveillance recordings are retained for 90 days or as the local law dictates.

### *Emergency Power and Facility and Environmental Protection*

Microsoft datacenter facilities have power backup and environmental protection systems. Datacenter Management team or the contracted vendor performs regular maintenance and testing of these systems.

## Logical Access

### *Customer Data and Systems Access Management (Customers)*

**Customer Registration**

Azure customers register for Azure services by setting up a subscription through the MOCP using a Microsoft Account or Organizational Account. Additionally, depending on the service, customers have the ability to register for the service via the service specific portal. MOCP, including billing and registration, and Microsoft Account / Organizational Account, including password management, are not in scope of this SOC report.

After registration, customers can request the creation of Storage accounts, hosted services, tenants, roles, and role instances within their subscription using the Azure Portal or programmatically through the SMAPI, which is the HTTPS interface exposed to external customers. The SMAPI allows customers to deploy and manage their services and their account. Among other things, this involves the ability to modify hosted services and Storage accounts, pick the geo-location for these accounts and place them in affinity groups, update configurations, 'swap' deployments and in essence, do all the non-creation related deployment / management operations that customers can do through the Azure Portal.

Additionally, customers can utilize the Azure Active Directory Graph API for programmatic access to Azure Active Directory through REST API endpoints. Applications can use the Graph API to perform create, read, update and delete (CRUD) operations on directory data and objects, e.g., common operations for a user object like create new users in directory, get user details, update user properties, and ascertain role-based access for user's group membership. Customers can also use the Azure Active Directory Module for Windows PowerShell cmdlets (provisioning API) to automate a number of deployment and management tasks. Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Microsoft public website.

**Virtual Machine Customization**

Upon creation of a VM, the VM image includes customizations to performance, security and productivity. However, the image may be customized further by the customer to suit their needs. Hardening of the image is the responsibility of the customer.

**Identity and Access Management**

Access to the Azure subscription through the Azure Portal is controlled by the Microsoft Account / Organizational Account. The ability to authenticate with the Microsoft Account / Organizational Account associated with the Azure subscription grants full control to all of the hosted services and Storage accounts within that subscription. (Note: Microsoft Account / Organizational Account and its associated authentication mechanisms are not in scope of this SOC report).

User sessions in the Azure portal can be configured by customers to automatically sign the user out of the Azure Portal session after a stipulated period of inactivity, protecting resources from unauthorized activity.

Location awareness technologies are implemented as part of the Azure Portal where location of the machine used for authentication is factored into the validation of the user identity. Where the user identity cannot be validated, Azure Portal would require the user to provide additional information to confirm their identity that could include MFA and / or secondary contact information for verification.

Applications can also access Azure services by using APIs (also known as SMAPI). SMAPI authentication is based on a user-generated public / private key pair and self-signed certificate registered through the Azure Portal. It is the customer's responsibility to safeguard the certificate.

The certificate is then used to authenticate subsequent access to SMAPI. SMAPI queues request to the Fabric, which then provisions, initializes, and manages the required application. Customers can monitor and manage their applications via the Azure Portal or programmatically through SMAPI using the same authentication mechanism.

In addition, customers can enable defined ports and protocols, e.g., RDP or SSH for Linux based services, on their instances and create local user accounts through the Azure Portal or SMAPI for debugging / troubleshooting issues with their applications. Customers are responsible for managing the local user accounts created.

Azure Scheduler and Logic Apps allow users to run jobs such as calling HTTP/S endpoints or posting messages to Azure Storage queues on any schedule. Jobs can be integrated with user applications and can be configured to run immediately, or on a recurring schedule or anytime in the future. Jobs can be configured to call services both inside and outside of Azure. Jobs are processed as per the job settings defined by the customer. In case an error occurs during the processing, the job is retried based on the retry interval as mentioned by the customer. Errors are monitored and appropriate action is taken based on the settings defined by the customer. Jobs configured by customer administrators are executed within thirty (30) minutes of the scheduled job run and are repeated based on the defined recurrence settings.

Azure Automation allows users to create, monitor, manage, and deploy resources in the Azure environment using runbooks. These runbooks can be configured and schedules can be created to automate the manual, long-running, error-prone, and frequently repeated tasks that are commonly performed in a cloud environment.

Services initialize the resource groups within the Azure Portal based on the customer configured templates. A customer tenant can create an Azure Resource Manager using an ARM template. The template deploys and provisions all resources for any application in a single, coordinated operation. In the template, a customer tenant can define the resources that are needed for the application and specify deployment parameters to input values for different environments. The template consists of JSON and expressions which the customer tenant can use

to construct values for their deployment. Later, these resources under ARM can be accessed, monitor utilization, and reconfigure based on capacity utilization using the deployment parameters that were entered during ARM creation. Further, customer data is accessible within agreed upon services in data formats compatible with providing those services.

**Access to Customer Virtual Machines**

External traffic to customer VMs is protected via ACLs but can be configured by the customer to allow external traffic only to customer designated ports and protocols. There is no port that is open by default unless explicitly configured by the customer in the service definition file. Once configured, the Azure Fabric Controller automatically updates the network traffic rule sets to allow external traffic only to the customer designated ports.

Customers can connect to their VMs via the ports and protocols defined by them, create credentials (i.e., username and password) and choose a certificate to encrypt the credentials during initial set-up that expires within 14 days through a secured mechanism. Authentication after set-up is performed using the self-created credentials. The connection is secured via Transport Layer Security (TLS) using a self-signed certificate generated by the VM instance. Customers can also upload custom certificates via the Azure Portal and configure their instances to use them securely.

**Access to Customer Storage Account Data**

Access to Azure Storage (i.e., blobs, tables, queues, files and disks) is governed by the SAK that is associated with each Storage account. Access to the SAK provides full control over the data in the Storage account.

Access to Azure Storage data can also be controlled through a Shared Access Signature (SAS). The SAS is created through a query template (URL), signed with the SAK. That signed URL can be given to another process, which can then fill in the details of the query and make the request of the Storage service. Authentication is still based on a signature created using the SAK, but it is sent to the Storage server by a third party. Access using the SAS can be limited in terms of validity time, permission set and what portions of the Storage account are accessible.

Data security beyond the access controls described above, such as fine-grain access controls or encryption, is the responsibility of the customer with exception to Managed Disk where encryption is enabled by default.

### *Identity and Access Management - Self Service Password Reset*

Self-Service Password Reset (SSPR) for users is a feature which allows end-users in customer organization to reset their passwords automatically without calling an administrator or helpdesk for support. SSPR has three main components:

1. **Password Reset Policy Configuration Portal** - Administrators can control different facets of password reset policy in the Azure Portal.

2. **User Registration Portal** - Users can self-register for password reset through a web portal.

3. **User Password Reset Portal** - Users can reset their own passwords using a number of different challenges in accordance with the administrator-controlled password-reset policy.

**Customer Administrative Passwords**

The One Time Password (OTP) generation module is implemented as a worker role within the Azure AD platform and OTP used for self-service password reset are randomly generated. These OTPs expire after their usage or a

pre-defined time limit. OTP generated for email and SMS are validated. Additionally, the OTP values are to be provided within the same session where the OTP was requested.

For the password reset process, the only information displayed within the HTTPS response packets is the masked phone number and cookies required to reset the password. The new passwords supplied by customer administrators within the SSPR portal adhere to the Azure AD password policy requirements. The SSPR portal is only accessible through HTTPS port and the new passwords supplied by the customers are encrypted during transmission over external networks.

This also applies to the initial temporary password generated for the user. These temporary passwords have a pre-defined time limit before it expires and forces users to change it on first usage.

### *Quotas and Thresholds*

Where applicable, quotas are enforced on Azure services as configured by the service administrators. Quota name, the threshold value for the quota, and the behavior on exceeding the quota, have been specified to protect customer entities from availability related issues.

## Business Continuity and Resiliency

Microsoft has established an organization-wide Enterprise Business Continuity Management (EBCM) framework that serves as a guideline for developing Azure Business Continuity Program. The program includes Business Continuity Policy, Implementation Guidelines, Business Impact Analysis (BIA), Risk Assessment, Dependency Analysis, Business Continuity Plan (BCP), Incident Management Plan, and procedures for monitoring and improving the program. The Business Continuity Management (BCM) Program Manager manages the program for Azure, and the datacenter Service Resiliency (SR) program is coordinated through the datacenter SR Program Management Office to ensure that the program adheres to a coherent long-term vision and mission, and is consistent with enterprise program standards, methods, policies, and metrics.

The Disaster Recovery Plan (DRP) is intended for usage by Azure Incident Managers for the recovery from high severity incidents (disasters) for its critical processes. The BCP and DRP are reviewed periodically.

The BCP and / or DRP includes scope and applicable dependencies for the services, restoration procedures, and communications with appropriate teams (i.e. Incident Management). The BCP and DRP are reviewed at least annually by a designated user and made available to all applicable users. The Business Continuity team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for various loss scenarios. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.

The BCM charter provides strategic direction and leadership to various aspects of the datacenter organization. The BCM program is coordinated through the Program Management Office to ensure that the program adheres to a coherent long-term vision and mission, and is consistent with enterprise program standards, methods, policies, and metrics.

### *Azure Resiliency Program*

Azure has defined the BCP to serve as a guide to respond, recover and resume operations during a serious adverse event. The BCP covers the key personnel, resources, services and actions required to continue critical business processes and operations. This plan is intended to address extended business disruptions. The development of the BCP is based on recommended guidelines of Microsoft's EBCM.

In scope for this plan are Azure's critical business processes (defined as needed within 24 hours or less). These processes were determined during a BIA, in which Azure estimated potential operational and financial impacts

if they could not perform a process, and determined the Recovery Time Objective (RTO) and Recovery Point Objective (RPO) of the process. Following the BIA, a Non-Technical Dependency Analysis was performed to determine the specific people, applications, vital records, and user requirements necessary to perform the process. The BCP's scope covers only the critical business processes determined during the BIA.

On a periodic basis, Azure performs testing of the BCP, or implementation of the plan due to a live event, to assess the effectiveness and usability of the BCP and to identify areas where risks can be eliminated or mitigated. Where applicable, third parties are involved in the test if there are dependencies associated with them. The results of testing are documented, validated and approved by appropriate personnel. This information is used to create and prioritize work items.

### *Datacenter Service Resiliency Program*

As part of the datacenter SR program, the Datacenter Management team develops the methods, policies and metrics that address the information security requirements needed for the organization's business continuity. The team develops BCPs and DRPs for the continued operations of critical processes and required resources in the event of a disruption.

Additionally, the Datacenter Management team conducts and documents a resiliency assessment specific to the datacenter's operations on an annual basis or prior to proposed significant changes.

### *Capacity Management*

The Networking team continually monitors the network to ensure availability and addresses capacity issues in a timely manner. The process for weekly capacity review is initiated by the Network Capacity Management team. The review includes an analysis of the capacity based on various parameters and the Network Hotlist report. Actions identified from the review are assigned for appropriate resolution. Additionally, the Microsoft Capacity Management team projects future capacity requirements based on internal operational reports, revenue forecasts and inputs from internal component teams.

### *Third Party Management*

Third parties undergo a review process through Global Procurement and an approved vendor list has been established. Purchase orders to engage a third-party require a Microsoft Master Vendor Agreement (MMVA) to be established or a review to be performed by CELA. In addition to MMVA, a signed NDA is also required. Vendors requiring access to source code need to be approved by the General Manager and CELA, and sign a Source Code Licensing Agreement.

Microsoft's exit strategy for critical suppliers is to have multiple suppliers readily available in case an exit is needed. Each supplier is assessed against the same indicators of success and resource requirements.

Periodic reviews are performed on third parties against their applicable SLAs and security requirements. Any findings from these reviews are tracked to resolution and / or require further reviews with the third party.

## Asset Management

Azure assets are classified in accordance with Microsoft Online Services Classification guidelines. The classification process is owned by the Azure Global team. There are five categories for classification: Non-business, Public, General, Confidential, and Highly Confidential. Steps are taken to protect assets commensurate with the respective asset's classification and its data sovereignty. Review of asset inventory, ownership, and classification is performed at least semi-annually.

The Azure Scope Boundary inventory of servers is monitored and maintained by the Azure Inventory team. On a monthly basis, the Azure Inventory team checks for completeness and accuracy of the inventory to ensure that it represents the Azure production environment appropriately.

Azure has created and implemented processes to control the delivery and removal of information assets through a centralized ticketing system. If equipment is shipped from multiple locations, a separate ticket must be created for each location.

In addition, network architecture is maintained as part of the inventory process. Metadata of the assets is collected and maintained within the inventory that provides an overview and flow of the network.

## Communications

### *Policies Communication*

Azure maintains communication with employees using the corporate intranet sites, email, training etc. The communications include, but are not limited to, communication of Azure policies and procedures, corporate events, new initiatives, and awareness on ISMS and Business Continuity Management System. Changes and updates to Azure policies and procedures, and all subsequent updates are distributed to all relevant stakeholders from the Azure Security, Privacy & Compliance intranet site.

### *Service Level Agreements*

Azure details commitments made regarding delivery or performance of services. These details are published in the SLAs available on the following website: https://www.microsoft.com/licensing/terms/.

### *Customer Communication*

Prior to provisioning Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure Platform Privacy Statement and Technical Overview of the Security Features in the Azure Platform.

Subsequent communication with customers is primarily achieved through the following options:

- Service Dashboard - Azure maintains and notifies customers of potential changes, events and incidents that may impact security, availability, processing integrity, or confidentiality of the services through an online Service Dashboard. The online Service Dashboard is updated in real time and RSS feeds are also available for subscription. Service Dashboard is used to disclose nature, timing, extent, and disposition of the incidents impacting various services.

- Legal - Any changes / updates to the Service Agreement, Terms, End User License Agreement (EULA), Acceptable Use Policy, Privacy Statement or SLAs are posted on the Azure website. The information presented in the Microsoft Trust Center is current as of the date at the top of each section, but is subject to change without notice. Customers are encouraged to review the Microsoft Trust Center periodically to be informed of new security, privacy and compliance developments.

- Contact Information - Customers can communicate with Azure support in various ways. The contact section presents forum access and direct contact for support.

Details around confidentiality and related security obligations for customer data are communicated through the Microsoft Trust Center (https://www.microsoft.com/en-us/trustcenter/). Additionally, description of the services, their key components, and recommendations on secure use of those services are available to

customers through the Azure Service Directory (https://azure.microsoft.com/en-us/services/). In addition, supported virtualization standards for the Azure environment are available on the Microsoft public website.

MSRC identifies, monitors, responds to, and resolves security incidents and vulnerabilities in Microsoft software. The MSRC is on constant alert for security threats, monitoring security newsgroups, and responding to reported vulnerabilities - 365 days a year. Microsoft operating system updates for virtual machines are made available through Microsoft Security Response Center (MSRC) site and Windows Update. Customers and other third parties can report suspected vulnerabilities by emailing secure@microsoft.com.

Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, and notify the impacted customer where permitted by law. Where Microsoft is required to produce customer data, the minimum data responsive to the request as required by law is produced. These procedures are reviewed at least on an annual basis.

## Baseline Configuration

### *Baseline Security Configuration for Services*

Technical standards and baselines have been established and communicated for OS deployments. Automated mechanisms and periodic scanning have been deployed to detect and troubleshoot exceptions and / or deviations from the baseline in the production environment. Where applicable, mechanisms are in place for services to re-image production servers with the latest baseline configuration at least on a monthly frequency. Further, OS and component teams review and update configuration settings and baseline configurations at least annually.

### *Network Configuration*

The Networking team has implemented procedural and technical standards for the deployment of network devices. These standards include baseline configurations for network devices, network architecture, and approved protocols and ports. The Networking team regularly monitors network devices for compliance with technical standards and potential malicious activities.

## Processing Integrity

Azure monitors the transactions invoked by the customer and relays them appropriately to the suitable RP end-point. RDFE, ARM and Microsoft Azure Portal utilize Azure configuration files for determining the types of events that are to be recorded when processing a transaction. Additionally, monitoring rules have been defined to process the events that have been recorded and generate alerts per the severity of an event and forward the same to the required stakeholders in the process, so they can take appropriate action. Azure management reviews portal performance monthly during the Azure Fundamentals (formerly through Service Health Review (SHR)) to evaluate the performance of Azure services against compliance with customer SLA requirements.

Requests made through Service Management API or the Azure Portal are segregated based on the subscription IDs and service requests are provisioned based on the parameters defined as per the customer's request. The request header contains the unique subscription ID of the user creating the request, the service requested and the request type allowing Azure to appropriately provision customer services. Azure performs input validation to restrict any non-permissible requests to the API which includes checking for validity of subscription IDs and the user, Denial of Service (DoS) attack mitigation, protection against XML bombs, namespace validation and header information.

## Relationship between CCM Criteria, Description Sections, and Trust Services Criteria

The description sections and the trust services criteria address the CCM criteria as follows:

| CCM Area | Relevant Description Section | Trust Services Criteria |
|---|---|---|
| Application & Interface Security | Security Organization - Information Security Program, Data Security, Software Development, Logical Access, Communications, Processing Integrity | CC6.1, CC6.2, CC6.6, CC8.1, PI1.2, PI1.3, PI1.4, PI1.5 |
| Audit Assurance & Compliance | Security Organization - Information Security Program | CC3.2, CC3.3, CC4.1, CC4.2 |
| Business Continuity Management & Operational Resilience | Security Organization - Information Security Program, Data Security, Change Management, Incident Management, Physical and Environmental Security, Communications, Business Continuity and Resiliency | CC1.1, CC1.4, CC2.3, CC3.2, CC3.3, CC5.1, CC5.2, CC4.1, CC4.2, CC7.2, A1.1, A1.2, A1.3 |
| Change Control & Configuration Management | Security Organization - Information Security Program, Operator Access, Change Management, Software Development, Physical and Environmental Security, Baseline Configuration | CC6.2, CC6.4, CC6.5, CC6.8, CC8.1, CC8.1 |
| Data Security & Information Lifecycle Management | Security Organization - Information Security Program, Operator Access, Data Security, Change Management, Software Development, Asset Management, Communications | C1.1, C1.2, CC2.2, CC2.3, CC3.2, CC3.3, CC6.1, CC6.6, CC6.7, CC8.1, PI1.4 |
| Datacenter Security | Operator Access, Data Security, Physical and Environmental Security, Logical Access, Asset Management | CC3.2, CC3.3, CC6.1, CC6.4, CC6.5, CC6.7 |
| Encryption & Key Management | Operator Access, Data Security, Logical Access | CC6.6, CC6.7 |
| Governance and Risk Management | Security Organization - Information Security Program, Physical and Environmental Security, Baseline Configuration | CC1.3, CC1.5, CC2.2, CC2.3, CC3.1, CC3.2, CC3.3, CC7.3, CC7.4, CC7.5 |
| Human Resources | Security Organization - Information Security Program | CC1.1, CC1.4, CC2.2, CC2.3, CC4.1, CC4.2, CC5.1, CC5.2, CC6.3, CC6.4, CC6.5, CC6.6, CC7.3, CC7.4, CC7.5 |
| Identity & Access Management | Security Organization - Information Security Program, Operator Access, Data Security, Change Management, Software Development, Vulnerability Management, Physical and Environmental Security, Logical | CC3.2, CC3.3, CC6.1, CC6.2, CC8.1 |

| CCM Area | Relevant Description Section | Trust Services Criteria |
|---|---|---|
| | Access, Communications, Baseline Configuration | |
| Infrastructure & Virtualization Security | Security Organization - Information Security Program, Operator Access, Data Security, Change Management, Software Development, Vulnerability Management, Logical Access, Business Continuity and Resiliency, Communications, Baseline Configuration | A1.1, A1.2, CC4.1, CC4.2, CC6.6, CC7.2, CC7.3, CC7.4, CC7.5 |
| Interoperability & Portability | Operator Access, Data Security, Logical Access, Communications | PI1.1 |
| Mobile Security | *N/A - Microsoft Azure does not support mobile devices* | |
| Security Incident Management, E-Discovery & Cloud Forensics | Security Organization - Information Security Program, Incident Management, Communications | CC2.2, CC2.3, CC4.1, CC4.2, CC6.4, CC6.5, CC7.2, CC7.3, CC7.4, CC7.5. CC9.2 |
| Supply Chain Management, Transparency and Accountability | Security Organization - Information Security Program, Operator Access, Change Management, Software Development, Business Continuity and Resiliency, Communications | CC2.2, CC2.3, CC6.4, CC6.5, CC9.2 |
| Threat and Vulnerability Management | Software Development, Vulnerability Management, Communications | CC6.6, CC6.8, CC7.1, CC7.2, CC8.1 |

### Relationship between Trust Services Criteria and Description Sections

Refer to Part A in Section IV of this report for the Trust Services Criteria and the related control activities that cover those criteria.

### Relationship between CCM Criteria and Description Sections

Refer to Part B in Section IV of this report for the CCM Criteria and the related control activities that cover those criteria.

### Relationship between C5 Objectives and Description Sections

Refer to Part C in Section IV of this report for the C5 objectives and the related control activities that cover those objectives.

# Section IV:
# Information Provided by Independent Service Auditor Except for Control Activities, Criteria and Objective Mappings

# Section IV: Information Provided by Independent Service Auditor Except for Control Activities, Criteria and Objective Mappings

## Introduction

This report, including the description of tests of controls and results thereof in this section are intended solely for the information and use of Microsoft Corporation (Microsoft), user entities of the Microsoft Corporation system related to its in-scope services and offerings for Microsoft Azure, Microsoft Dynamics 365, and Microsoft datacenters ("Azure") for Azure and Azure Government cloud environments, during some or all of the period April 1, 2021 to March 31, 2022, and business partners of Microsoft subject to risks arising from interactions with Microsoft's system, practitioners providing services to such user entities, and business partners, prospective user entities and business partners, and regulators who have sufficient knowledge and understanding of the following: the nature of the service provided by the service organization; how the service organization's system interacts with user entities, and other parties; internal control and its limitations; the applicable trust services criteria; the criteria set forth in the Cloud Security Alliance's (CSA) Cloud Controls Matrix (CCM) Version 3.0.1 control specifications ("CCM criteria"); the objectives set forth in the Bundesamt für Sicherheit in der Informationstechnik (BSI) Cloud Computing Compliance Criteria Catalogue ("C5") version published in January 2020; and the risks that may threaten the achievement of the applicable trust services criteria, CCM criteria, objectives set forth in C5 and how controls address those risks.

This section presents the following information provided by Microsoft:

- The controls established and specified by Microsoft to achieve the specified trust services criteria, the CCM criteria, and the objectives set forth in C5.

Also included in this section is the following information provided by Deloitte & Touche LLP:

- A description of the tests performed by Deloitte & Touche LLP to determine whether Microsoft's controls were operating with sufficient effectiveness to achieve the applicable trust services criteria, the CCM criteria, and the objectives set forth in C5. Deloitte & Touche LLP determined the nature, timing, and extent of the testing performed.
- The results of Deloitte & Touche LLP's tests of controls.

The examination was conducted in accordance with criteria as set forth in DC Section 200, 2018 Description Criteria for a Description of a Service Organization's System in a SOC 2® Report ("description criteria") and the suitability of the design and operating effectiveness of controls stated in the description throughout the period April 1, 2021 to March 31, 2022 to provide reasonable assurance that Microsoft's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity and confidentiality ("applicable trust services criteria") set forth in TSP Section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy*, of the American Institute of Certified Public Accountants (AICPA), and the AICPA Statement on Standards for Attestation Engagements No. 18 (SSAE 18) and International Standard on Assurance Engagements 3000, *Assurance Engagements Other Than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board. SSAE 18 is inclusive of the following: (1) AT-C 105, Concepts Common to all Attestation Engagements; and (2) AT-C 205, Examination Engagements.

Our testing of Microsoft's controls was restricted to the controls identified by Microsoft to meet the criteria related to Security, Availability, Processing Integrity, and Confidentiality, the CCM criteria, and the objectives

set forth in C5, listed in Section IV of this report and was not extended to controls described in Section III but not included in Section IV, or to controls that may be in effect at user organizations.

It is each user's responsibility to evaluate the information included in this report in relation to internal controls in place at individual user entities to obtain an understanding and to assess control risk at the user entities. The controls at user entities and Microsoft's controls should be evaluated together. If effective user entity controls are not in place, Microsoft's controls may not compensate for such weaknesses.

### Control environment elements

The control environment sets the tone of an organization, influencing the control consciousness of its people. It is the foundation for other components of internal control, providing discipline and structure. In addition to the tests of design, implementation, and operating effectiveness of controls identified by Microsoft, our procedures included tests of the following relevant elements of Microsoft's control environment:

1. Integrity and Ethical Values
2. Microsoft Standards of Business Conduct
3. Training and Accountability
4. Commitment to Competence
5. Compliance & Ethics, Internal Audit, Audit Committee
6. Risk Assessment
7. Monitoring
8. Information and Communication

Such tests included inquiry of the appropriate management, supervisory, and staff personnel; observation of Microsoft's activities and operations, inspection of Microsoft's documents and records, and reperformance of the application of Microsoft's controls. The results of these tests were considered in planning the nature, timing, and extent of our testing of the control activities described in this section.

Controls within the control environment have been categorized into the following domains:

1. Information Security (IS)
2. Operator Access (OA)
3. Data Security (DS)
4. Change Management (CM)
5. Security Development Lifecycle (SDL)
6. Vulnerability Management (VM)
7. Incident Management (IM)
8. Physical and Environmental Security (PE)
9. Logical Access (LA)
10. Business Continuity (BC)

11. Processing Integrity (PI)

12. Additional SOC Controls (SOC2)

13. Additional CCM Controls (CCM)

14. Additional Edge Sites Logical Access Controls (ED)

15. C5 Controls (C5)

### Tests of operating effectiveness

Our tests of the controls were designed to cover a representative number of transactions throughout the period from April 1, 2021 to March 31, 2022. In determining the nature, timing and extent of tests, we considered, (a) the nature and frequency of the controls being tested, (b) the types of available evidential matter, (c) the nature of the trust services criteria, the CCM criteria, and the objectives set forth in C5 to be met, (d) the assessed level of control risk, (e) the expected effectiveness of the tests, and (f) the results of our tests of the control environment.

### Description of testing procedures performed

Deloitte & Touche LLP performed a variety of tests relating to the controls listed in this section throughout the period from April 1, 2021 to March 31, 2022. Our tests of controls were performed on controls as they existed during the period April 1, 2021 to March 31, 2022 and were applied to those controls relating to in-scope trust services criteria, the CCM criteria and the objectives set forth in C5.

In addition to the tests listed below, ascertained through multiple inquiries with management and the control owner that each control activity listed below operated as described throughout the period. Tests performed are described below:

| Test | Description |
|---|---|
| Corroborative Inquiry | Conducted detailed interviews with relevant personnel to obtain evidence that the control was in operation during the report period and is accompanied by other procedures noted below that are necessary to corroborate the information derived from the inquiry. |
| Observation | Observed the performance of the control during the report period to evidence application of the specific control activity. |
| Examination of documentation/Inspection | If the performance of the control is documented, inspected documents and reports indicating performance of the control. |
| Reperformance of monitoring activities or manual controls | Obtained documents used in the monitoring activity or manual control activity and independently reperformed the procedures. Compared any exception items identified with those identified by the responsible control owner. |
| Reperformance of programmed processing | Input test data, manually calculated expected results, and compared actual results of processing to expectations. |

### Reliability of information produced by the Service Organization

We performed procedures to evaluate whether the information provided by Microsoft, which includes (a) information provided by Microsoft to the service auditor in response to ad hoc requests from the service auditor (e.g., population lists); (b) information used in the execution of a control (e.g., exception reports or transaction

reconciliations); and (c) information prepared for user entities (e.g., user access lists), was sufficiently reliable for our purposes by obtaining evidence about the accuracy and completeness of such information and evaluating whether the information was sufficiently precise and detailed for our purposes. Information we utilized as evidence may have included, but was not limited to:

- Standard "out of the box" reports as configured within the system
- Parameter-driven reports generated by Microsoft's systems
- Custom-developed reports that are not standard to the application such as scripts, report writers, and queries
- Spreadsheets that include relevant information utilized for the performance or testing of a control
- Analysis, schedules, or other evidence manually prepared and utilized by Microsoft

Our procedures to evaluate whether this information was sufficiently reliable included obtaining evidence regarding the accuracy and completeness included procedures to address (a) the accuracy and completeness of source data and (b) the creation and modification of applicable report logic and parameters. While these procedures were not specifically called out in the test procedures listed in this section, they were completed as a component of our testing to support the evaluation of whether or not the information is sufficiently precise and detailed for purposes of fully testing the controls identified by Microsoft.

### Reporting on results of testing

The concept of materiality is not applied when reporting the results of tests of controls for which deviations have been identified because Deloitte & Touche LLP does not have the ability to determine whether a deviation will be relevant to a particular user entity. Consequently, Deloitte & Touche LLP reports all deviations.

### Results of Testing Performed

The information regarding the tests of operating effectiveness is explained below in four parts:

**Part A:** Contains the Trust Services Criteria, the related control activities that cover those criteria, and the results of the test procedures performed.

**Part B:** Contains the CCM Criteria, the related control activities that cover those criteria, and the results of the test procedures performed.

**Part C:** Contains the objectives set forth in C5, the related control activities that cover those objectives, and the results of the test procedures performed.

**Part D:** Contains the details of the test procedures performed to test the operating effectiveness of the control activities, and the results of the testing performed.

The applicable trust services criteria, the CCM criteria, the objectives set forth in C5, and Azure's control activities in Part A, B, C and D are provided by Microsoft.

## Part A: Trust Services Criteria, Control Activities provided by Azure, and Test Results provided by Deloitte & Touche LLP

### *CONTROL ENVIRONMENT*

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC1.1** COSO Principle 1: The entity demonstrates a commitment to integrity and ethical values. | **ELC - 1.** Microsoft's values are accessible to employees via the Values SharePoint site and are updated as necessary by management.<br><br>**ELC - 2.** Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately.<br><br>**ELC - 3.** Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct.<br><br>**SOC2 - 11.** Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy.<br><br>**SOC2 - 12.** Microsoft personnel and contingent staff undergo formal screening, including background verification checks, as a part of the hiring process prior to being granted access. Additional screening is conducted in accordance with customer specific requirements, for employees with access to applicable data.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |
| **CC1.2** COSO Principle 2: The board of directors demonstrates independence from | **ELC - 4.** The Audit Committee (AC) reviews its Charter and Responsibilities on an annual basis, as listed in its calendar. The AC Responsibilities include meeting | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| management and exercises oversight of the development and performance of internal control. | with the external and internal auditors on a quarterly basis, providing oversight on the development and performance of controls, and completing an annual self-evaluation.<br><br>**ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment. | |
| **CC1.3** COSO Principle 3: Management establishes, with board oversight, structures, reporting lines, and appropriate authorities and responsibilities in the pursuit of objectives. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements. | No exceptions noted. |
| **CC1.4** COSO Principle 4: The entity demonstrates a commitment to attract, develop, and retain competent individuals in alignment with objectives. | **ELC - 1.** Microsoft's values are accessible to employees via the Values SharePoint site and are updated as necessary by management.<br><br>**ELC - 7.** Employees hold periodic "connects" with their managers to validate they are on the expected career path and facilitate greater collaboration. Employees also review their performance against their documented deliverables (priorities) and discuss the results with their managers.<br><br>**ELC - 8.** The Compensation Committee is responsible for reviewing and discussing plans for executive officer development and corporate succession plans for the CEO and other executive officers. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**SOC2 - 12.** Microsoft personnel and contingent staff undergo formal screening, including background verification checks, as a part of the hiring process prior to being granted access. Additional screening is conducted in accordance with customer specific requirements, for employees with access to applicable data.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | |
| **CC1.5** COSO Principle 5: The entity holds individuals accountable for their internal control responsibilities in the pursuit of objectives. | **ELC - 2.** Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately.<br><br>**ELC - 3.** Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct.<br><br>**ELC - 7.** Employees hold periodic "connects" with their managers to validate they are on the expected career path and facilitate greater collaboration. Employees also review their performance against their documented deliverables (priorities) and discuss the results with their managers.<br><br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**SOC2 - 11.** Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | |

***COMMUNICATION AND INFORMATION***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC2.1** COSO Principle 13: The entity obtains or generates and uses relevant, quality information to support the functioning of internal control. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | |
| **CC2.2** COSO Principle 14: The entity internally communicates information, including objectives and responsibilities for internal control, necessary to support the functioning of internal control. | **ELC - 2.** Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately.<br><br>**ELC - 3.** Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br><br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 10.** Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft’s Employee Handbook, which describes | |

| Trust Criteria | Azure Activity | Test Result |
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| | the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures. | |
| **CC2.3** COSO Principle 15: The entity communicates with external parties regarding matters affecting the functioning of internal control. | **ELC - 2.** Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately.<br><br>**ELC - 3.** Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br><br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 10.** Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and | |

| Trust Criteria | Azure Activity | Test Result |
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| | information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures. | |

***RISK ASSESSMENT***

| Trust Criteria | Azure Activity | Test Result |
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| **CC3.1** COSO Principle 6: The entity specifies objectives with sufficient clarity to enable the identification and assessment of risks relating to objectives. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | **ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., | |

| Trust Criteria | Azure Activity | Test Result |
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| | Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | |
| **CC3.2** COSO Principle 7: The entity identifies risks to the achievement of its objectives across the entity and analyzes risks as a basis for determining how the risks should be managed. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions. | |

| Trust Criteria | Azure Activity | Test Result |
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| | Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |
| **CC3.3** COSO Principle 8: The entity considers the potential for fraud in assessing risks to the achievement of objectives. | **ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | **SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established.<br><br>**BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production | |

| Trust Criteria | Azure Activity | Test Result |
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| | environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged. | |

| Trust Criteria | Azure Activity | Test Result |
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| | **VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |
| **CC3.4** COSO Principle 9: The entity identifies and assesses changes that could significantly impact the system of internal control. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 8.** The Compensation Committee is responsible for reviewing and discussing plans for executive officer development and corporate succession plans for the CEO and other executive officers.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services.<br><br>**SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization’s approach to meet these requirements for each information system | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | |

***MONITORING ACTIVITIES***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC4.1** COSO Principle 16: The entity selects, develops, and performs ongoing and/or separate evaluations to ascertain whether | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| the components of internal control are present and functioning. | assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**SOC2 - 27.** Microsoft Azure undergoes independent audits and assessments, to monitor and verify compliance with security requirements, at least annually. Findings are recorded, reviewed, prioritized, and remediation plans are developed.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated. | |

| Trust Criteria | Azure Activity | Test Result |
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| | **IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 8.** Penetration testing of critical infrastructure components is performed at least annually based on documented Penetration testing procedures and findings are documented, tracked, and remediated.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 10.** Azure provides logging mechanisms that can be configured by customers to log activities and performance metrics. | |
| **CC4.2** COSO Principle 17: The entity evaluates and communicates internal control deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the board of directors, as appropriate. | **ELC - 4.** The Audit Committee (AC) reviews its Charter and Responsibilities on an annual basis, as listed in its calendar. The AC Responsibilities include meeting with the external and internal auditors on a quarterly basis, providing oversight on the development and performance of controls, and completing an annual self-evaluation.<br><br>**ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures. | |

| Trust Criteria | Azure Activity | Test Result |
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| | **VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards. | |

***CONTROL ACTIVITIES***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC5.1** COSO Principle 10: The entity selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
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| | reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br><br>**CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams. | |
| **CC5.2** COSO Principle 11: The entity also selects and develops general control activities over technology to support the achievement of objectives. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested |

| Trust Criteria | Azure Activity | Test Result |
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| | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br><br>**OA - 21.** Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br><br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment. | |
| **CC5.3** COSO Principle 12: The entity deploys control activities through policies that establish what is expected and in procedures that put policies into action. | **ELC - 2.** Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately.<br><br>**ELC - 3.** Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct.<br><br>**ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 7.** Employees hold periodic "connects" with their managers to validate they are on the expected career path and facilitate greater collaboration. Employees also review their performance against their documented deliverables (priorities) and discuss the results with their managers.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established. | |

## *LOGICAL AND PHYSICAL ACCESS CONTROLS*

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC6.1** The entity implements logical access security software, infrastructure, and architectures over protected information assets to protect them from security events to meet the entity's objectives. | **DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 11.** Data corresponding to Azure is backed up to another region other than the primary data location and retained as per the retention policy.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained. | **Exception Noted:**<br><br>**OA - 15:**<br><br>For eight of 25 sampled network devices, evidence related to password rotation was not retained and not available for inspection to corroborate that the passwords were changed on a periodic basis. |

| Trust Criteria | Azure Activity | Test Result |
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| | **DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated.<br><br>**DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented.<br><br>**LA - 4.** Customer data that is designated as "confidential" is protected while in storage within Azure services.<br><br>**LA - 5.** User sessions within Azure can be configured by customers to expire after a stipulated period of inactivity.<br><br>**LA - 9.** Service initializes the resource groups within the management portal based on the customer configured templates. Service allows customers to monitor and control the distribution of system resources created within the resource group in order to prevent resources from being congested.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password | **OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**LA - 12.** Images may be customized and access to images may be restricted by the customer. Updates to available images are communicated to through customer-facing websites.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br><br>- expiration<br>- length<br>- complexity<br>- history<br><br>Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity. | |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br><br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**OA - 15.** Passwords used to access Azure network devices are restricted to authorized individuals based on job responsibilities and changed on a periodic basis.<br><br>**OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**OA - 18.** Azure network is segregated to separate customer traffic from management traffic.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br><br>**OA - 21.** Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access.<br><br>**SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established. | |
| **CC6.2** Prior to issuing system credentials and granting system access, the entity registers and authorizes new internal and external users whose access is administered by the entity. For those users whose access is administered by the entity, user system credentials are removed when user access is no longer authorized. | **LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity.<br><br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established. | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | |
| **CC6.3** The entity authorizes, modifies, or removes access to data, software, functions, and other protected information assets based on roles, responsibilities, or the system design and changes, giving consideration to the concepts of least privilege and segregation of duties, to meet the entity's objectives. | **LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity. | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br><br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**OA - 15.** Passwords used to access Azure network devices are restricted to authorized individuals based on job responsibilities and changed on a periodic basis.<br><br>**OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription. | subsequent to September 30, 2021 and no additional exceptions were noted.<br><br>**OA - 15:**<br><br>For eight of 25 sampled network devices, evidence related to password rotation was not retained and not available for inspection to corroborate that the passwords were changed on a periodic basis. |
| **CC6.4** The entity restricts physical access to facilities and protected information assets (for example, data center facilities, back-up media storage, and other sensitive locations) to authorized personnel to meet the entity's objectives. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 3.** Physical access to the datacenter is reviewed quarterly and verified by the Datacenter Management team.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | |
| **CC6.5** The entity discontinues logical and physical protections over physical assets only after the ability to read or recover data and software from those assets has been diminished and is no longer required to meet the entity's objectives. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 3.** Physical access to the datacenter is reviewed quarterly and verified by the Datacenter Management team.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database. | No exceptions noted. |
| **CC6.6** The entity implements logical access security measures to protect against threats from sources outside its system boundaries. | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br><br>**DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks. | **Exception Noted:**<br><br>**DS - 1:**<br><br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, |

| Trust Criteria | Azure Activity | Test Result |
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| | Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the | 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**OA - 17.** External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols.<br><br>**PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br><br>**VM - 7.** Procedures to configure and monitor network devices in the scope boundary, and resolve issues, have been established.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards. | |
| **CC6.7** The entity restricts the transmission, movement, and removal of information to authorized internal and external users and processes, and protects it during | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| transmission, movement, or removal to meet the entity's objectives. | Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | |
| **CC6.8** The entity implements controls to prevent or detect and act upon the introduction of unauthorized or malicious software to meet the entity's objectives. | **ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one |

| Trust Criteria | Azure Activity | Test Result |
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| | **CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br><br>**PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production | server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| Trust Criteria | Azure Activity | Test Result |
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| | environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 7.** Procedures to configure and monitor network devices in the scope boundary, and resolve issues, have been established.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC7.1** To meet its objectives, the entity uses detection and monitoring procedures to identify (1) changes to configurations that result in the introduction of new vulnerabilities, and (2) susceptibilities to newly discovered vulnerabilities. | **CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br><br>**CM - 8.** The Technical Security Services team develops security configuration standards for systems in the physical environment that are consistent with industry-accepted hardening standards. These configurations are documented in system baselines, are reviewed annually, and relevant configuration changes are communicated to impacted teams.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 7.** Procedures to configure and monitor network devices in the scope boundary, and resolve issues, have been established.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 11.** Microsoft operating system updates for virtual machines are made available through Microsoft Security Response Center (MSRC) site and Windows Update.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures. | |
| **CC7.2** The entity monitors system components and the operation of those components for anomalies that are indicative of malicious acts, natural disasters, and errors affecting the entity's ability to meet its objectives; anomalies are analyzed to determine whether they represent security events. | **BC - 9.** Datacenter Management teams conduct and document a resiliency assessment, specific to the datacenter's operations, on an annual basis or prior to proposed significant changes.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented. | delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 7.** Procedures to configure and monitor network devices in the scope boundary, and resolve issues, have been established.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**VM - 10.** Azure provides logging mechanisms that can be configured by customers to log activities and performance metrics.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | |
| **CC7.3** The entity evaluates security events to determine whether they could or have resulted in a failure of the entity to meet its objectives (security incidents) and, if so, takes actions to prevent or address such failures. | **ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted.<br><br>**IM - 5.** The Cyber Defense Operations Center (CDOC) team provides reports of information security events to Cloud + AI management on a quarterly basis. Problem statements for systemic issues are submitted to executive leadership for review.<br><br>**IM - 6.** The Cyber Defense Operations Center (CDOC) team performs annual tests on the security incident response procedures.<br><br>**PE - 8.** Datacenter physical security management reviews and approves the incident response procedures on a yearly basis. The incident security response procedures detail the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC7.4** The entity responds to identified security incidents by executing a defined incident response program to understand, contain, remediate, and communicate security incidents, as appropriate. | **ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted.<br><br>**IM - 5.** The Cyber Defense Operations Center (CDOC) team provides reports of information security events to Cloud + AI management on a quarterly basis. Problem statements for systemic issues are submitted to executive leadership for review.<br><br>**IM - 6.** The Cyber Defense Operations Center (CDOC) team performs annual tests on the security incident response procedures.<br><br>**PE - 8.** Datacenter physical security management reviews and approves the incident response procedures on a yearly basis. The incident security response procedures detail the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |
| **CC7.5** The entity identifies, develops, and implements activities to recover from identified security incidents. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted.<br><br>**IM - 5.** The Cyber Defense Operations Center (CDOC) team provides reports of information security events to Cloud + AI management on a quarterly basis. Problem statements for systemic issues are submitted to executive leadership for review.<br><br>**IM - 6.** The Cyber Defense Operations Center (CDOC) team performs annual tests on the security incident response procedures.<br><br>**PE - 8.** Datacenter physical security management reviews and approves the incident response procedures on a yearly basis. The incident security response procedures detail the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures. | |

***CHANGE MANAGEMENT***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC8.1** The entity authorizes, designs, develops or acquires, configures, documents, tests, approves, and implements changes to infrastructure, data, software, and procedures to meet its objectives. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br><br>**CM - 8.** The Technical Security Services team develops security configuration standards for systems in the physical environment that are consistent with industry-accepted hardening standards. These configurations are documented in system baselines, are reviewed annually, and relevant configuration changes are communicated to impacted teams. | **Exception Noted:**<br><br>**CM - 13:**<br><br>For six of the total population of 100 break-glass alerts, evidence of review by a team member who did not perform the break-glass operation was not retained to verify if appropriate changes were made to the production environment. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team.<br><br>**CM - 10.** Secure configurations for datacenter software are applied through defined change management procedures including documentation, testing and approval.<br><br>**CM - 11.** Change management processes include established workflows and procedures to address emergency change requests.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**CM - 13.** Any changes to production via break-glass have been reviewed to ensure all changes were appropriate.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**LA - 4.** Customer data that is designated as "confidential" is protected while in storage within Azure services.<br><br>**LA - 8.** The private root key belonging to the Azure services is protected from unauthorized access.<br><br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br><br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment. | |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams.<br><br>**SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments.<br><br>**SDL - 5.** A centralized repository for managing source code changes to the Azure platform is used. Procedures to authorize Azure personnel to submit source code changes based on their role, are established. Code changes submitted to the centralized repository are logged and can be traced to the individuals or system components executing them.<br><br>**SDL - 6.** Source code builds are scanned for malware prior to release to production.<br><br>**SDL - 7.** The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners.<br><br>**SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br><br>**SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | |

***RISK MITIGATION***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC9.1** The entity identifies, selects, and develops risk mitigation activities for risks arising from potential business disruptions. | **ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **CC9.2** The entity assesses and manages risks associated with vendors and business partners. | **ELC - 6.** Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct.<br><br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**C5 - 2.** Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually. | No exceptions noted. |

***ADDITIONAL CRITERIA FOR AVAILABILITY***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **A1.1** The entity maintains, monitors, and evaluates current processing capacity and use of system components (infrastructure, data, and software) to manage capacity | **BC - 3.** Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| demand and to enable the implementation of additional capacity to help meet its objectives. | **BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**BC - 10.** The network is monitored to ensure availability and address capacity issues in a timely manner.<br><br>**LA - 6.** The jobs configured by the customer administrators are executed within thirty (30) minutes of the scheduled job run and are repeated based on the defined recurrence settings.<br><br>**LA - 7.** Quotas on Azure services are enforced as configured by the service administrators to protect against availability related issues.<br><br>**LA - 10.** The errors generated during the job execution are monitored and appropriate action is taken based on the job settings defined by the customer administrator.<br><br>**PI - 2.** Microsoft Azure management reviews portal performance monthly to evaluate compliance with customer SLA requirements.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **A1.2** The entity authorizes, designs, develops or acquires, implements, operates, approves, maintains, and monitors environmental protections, software, data back-up processes, and recovery infrastructure to meet its objectives. | **BC - 3.** Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements.<br><br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**BC - 9.** Datacenter Management teams conduct and document a resiliency assessment, specific to the datacenter's operations, on an annual basis or prior to proposed significant changes.<br><br>**DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br><br>Customers are able to determine geographical regions of the data processing and storage, including data backups.<br><br>**DS - 8.** Data Protection Services (DPS) backs up data for properties based on a defined schedule and upon request of the properties. Data is retained according to the data type identified by the property. DPS investigates backup errors and skipped files and follows up appropriately.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**DS - 11.** Data corresponding to Azure is backed up to another region other than the primary data location and retained as per the retention policy.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures.<br><br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated.<br><br>**PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures.<br><br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **A1.3** The entity tests recovery plan procedures supporting system recovery to meet its objectives. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities. | No exceptions noted. |

***ADDITIONAL CRITERIA FOR CONFIDENTIALITY***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **C1.1.** The entity identifies and maintains confidential information to meet the entity's objectives related to confidentiality. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated.<br><br>**SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | |
| **C1.2.** The entity disposes of confidential information to meet the entity's objectives related to confidentiality. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated. | No exceptions noted. |

***ADDITIONAL CRITERIA FOR PROCESSING INTEGRITY***

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| **PI1.1** The entity obtains or generates, uses, and communicates relevant, quality information regarding the objectives related to processing, including definitions of data processed and product and service specifications, to support the use of products and services. | **DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated.<br>**OA - 19.** Microsoft Azure has published virtualization industry standards supported within its environment.<br>**PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br>**SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **SOC2 - 10.** Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service.<br><br>**SOC2 - 28.** Customer data is accessible within agreed upon services in data formats compatible with providing those services. | |
| **PI1.2** The entity implements policies and procedures over system inputs, including controls over completeness and accuracy, to result in products, services, and reporting to meet the entity's objectives. | **PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br><br>**PI - 4.** Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | No exceptions noted. |
| **PI1.3** The entity implements policies and procedures over system processing to result in products, services, and reporting to meet the entity's objectives. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br><br>**DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | Customers are able to determine geographical regions of the data processing and storage, including data backups.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**LA - 10.** The errors generated during the job execution are monitored and appropriate action is taken based on the job settings defined by the customer administrator.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures.<br><br>**PI - 1.** Microsoft Azure monitors the transactions invoked by the customer and relays them appropriately to the suitable Resource Provider (RP) end-point. Actions are taken in response to defined threshold events.<br><br>**PI - 2.** Microsoft Azure management reviews portal performance monthly to evaluate compliance with customer SLA requirements.<br><br>**PI - 4.** Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | |
| **PI1.4** The entity implements policies and procedures to make available or deliver output completely, accurately, and timely in accordance with specifications to meet the entity's objectives. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
|---|---|---|
| | **CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented.<br><br>**PI - 4.** Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | |
| **PI1.5** The entity implements policies and procedures to store inputs, items in processing, and outputs completely, accurately, and timely in accordance with system specifications to meet the entity's objectives. | **DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br><br>**DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures. | No exceptions noted. |

| Trust Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| | **DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated. | |

## Part B: CCM Criteria, Control Activities provided by Azure, and Test Results provided by Deloitte & Touche LLP

### *AIS: Application & Interface Security, Application Security*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **AIS-01** Applications and programming interfaces (APIs) shall be designed, developed, deployed, and tested in accordance with leading industry standards (e.g., OWASP for web applications) and adhere to applicable legal, statutory, or regulatory compliance obligations. | **DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br><br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment.<br><br>**SDL - 7.** The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners. | No exceptions noted. |
| **AIS-02** Prior to granting customers access to data, assets, and information systems, identified security, contractual, and regulatory requirements for customer access shall be addressed. | **LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**SOC2 - 10.** Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service. | No exceptions noted. |
| **AIS-03** Data input and output integrity routines (i.e., reconciliation and edit checks) shall be implemented for application interfaces and databases to prevent manual or systematic processing errors, corruption of data, or misuse. | **PI - 3.** Microsoft Azure performs input validation to restrict any non-permissible requests to the API.<br><br>**PI - 4.** Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **AIS-04** Policies and procedures shall be established and maintained in support of data security to include (confidentiality, integrity and availability) across multiple system interfaces, jurisdictions and business functions to prevent improper disclosure, alteration, or destruction. | **DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated. | No exceptions noted. |

***AAC: Audit Assurance & Compliance, Audit Planning***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **AAC-01** Audit plans shall be developed and maintained to address business process disruptions. Auditing plans shall focus on reviewing the effectiveness of the implementation of security operations. All audit activities must be agreed upon prior to executing any audits. | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | No exceptions noted. |
| **AAC-02** Independent reviews and assessments shall be performed at least annually to ensure that the organization addresses nonconformities of established policies, standards, procedures, and compliance obligations. | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **AAC-03** Organizations shall create and maintain a control framework which captures standards, regulatory, legal, and statutory requirements relevant for their business needs. The control framework shall be reviewed at least annually to ensure changes that could affect the business processes are reflected. | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements. | No exceptions noted. |

***BCR: Business Continuity Management & Operational Resilience, Business Continuity Planning***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **BCR-01** A consistent unified framework for business continuity planning and plan development shall be established, documented and adopted to ensure all business continuity plans are consistent in addressing priorities for testing, maintenance, and information security requirements.<br><br>Requirements for business continuity plans include the following:<br><br>• Defined purpose and scope, aligned with relevant dependencies<br>• Accessible to and understood by those who will use them<br>• Owned by a named person(s) who is responsible for their review, update, and approval | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 3.** Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements.<br><br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| • Defined lines of communication, roles, and responsibilities<br>• Detailed recovery procedures, manual work-around, and reference information<br>• Method for plan invocation | | |
| **BCR-02** Business continuity and security incident response plans shall be subject to testing at planned intervals or upon significant organizational or environmental changes. Incident response plans shall involve impacted customers (tenant) and other business relationships that represent critical intra-supply chain business process dependencies. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly. | No exceptions noted. |
| **BCR-03** Datacenter utilities services and environmental conditions (e.g., water, power, temperature and humidity controls, telecommunications, and internet connectivity) shall be secured, monitored, maintained, and tested for continual effectiveness at planned intervals to ensure protection from unauthorized interception or damage, and designed with automated fail-over or other redundancies in the event of planned or unplanned disruptions. | **BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |
| **BCR-04** Information system documentation (e.g., administrator and user guides, and architecture diagrams) shall be made available to authorized personnel to ensure the following: | **SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| • Configuring, installing, and operating the information system<br>• Effectively using the system's security features | | |
| **BCR-05** Physical protection against damage from natural causes and disasters, as well as deliberate attacks, including fire, flood, atmospheric electrical discharge, solar induced geomagnetic storm, wind, earthquake, tsunami, explosion, nuclear accident, volcanic activity, biological hazard, civil unrest, mudslide, tectonic activity, and other forms of natural or man-made disaster shall be anticipated, designed, and have countermeasures applied. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |
| **BCR-06** To reduce the risks from environmental threats, hazards, and opportunities for unauthorized access, equipment shall be kept away from locations subject to high probability environmental risks and supplemented by redundant equipment located at a reasonable distance. | **DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br>Customers are able to determine geographical regions of the data processing and storage, including data backups. | No exceptions noted. |
| **BCR-07** Policies and procedures shall be established, and supporting business processes and technical measures implemented, for equipment maintenance ensuring continuity and availability of operations and support personnel. | **PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **BCR-08** Protection measures shall be put into place to react to natural and man-made threats based upon a geographically-specific Business Impact Assessment. | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services. | No exceptions noted. |
| **BCR-09** There shall be a defined and documented method for determining the impact of any disruption to the organization (cloud provider, cloud consumer) that must incorporate the following:<br>• Identify critical products and services<br>• Identify all dependencies, including processes, applications, business partners, and third party service providers<br>• Understand threats to critical products and services<br>• Determine impacts resulting from planned or unplanned disruptions and how these vary over time<br>• Establish the maximum tolerable period for disruption<br>• Establish priorities for recovery<br>• Establish recovery time objectives for resumption of critical products and services within their maximum tolerable period of disruption<br>• Estimate the resources required for resumption | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **BCR-10** Policies and procedures shall be established, and supporting business processes and technical measures implemented, for appropriate IT governance and service management to ensure appropriate planning, delivery and support of the organization's IT capabilities supporting business functions, workforce, and / or customers based on industry acceptable standards (i.e., ITIL v4 and COBIT 5). Additionally, policies and procedures shall include defined roles and responsibilities supported by regular workforce training. | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |
| **BCR-11** Policies and procedures shall be established, and supporting business processes and technical measures implemented, for defining and adhering to the retention period of any critical asset as per established policies and procedures, as well as applicable legal, statutory, or regulatory compliance obligations. Backup and recovery measures shall be incorporated as part of business continuity planning and tested accordingly for effectiveness. | **DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures.<br><br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated. | No exceptions noted. |

## *CCC: Change Control & Configuration Management, New Development / Acquisition*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **CCC-01** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to ensure the development and / or acquisition of new data, physical or virtual applications, infrastructure network and systems components, or any corporate, operations and / or datacenter facilities have been pre-authorized by the organization's business leadership or other accountable business role or function. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology. | No exceptions noted. |
| **CCC-02** External business partners shall adhere to the same policies and procedures for change management, release, and testing as internal developers within the organization (e.g., ITIL service management processes). | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | No exceptions noted. |
| **CCC-03** Organization shall follow a defined quality change control and testing process (e.g., ITIL Service Management) with established baselines, testing, and release standards that focus on system availability, confidentiality, and integrity of systems and services. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | |
| **CCC-04** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to restrict the installation of unauthorized software on organizationally-owned or managed user end-point devices (e.g., issued workstations, laptops, and mobile devices) and IT infrastructure network and systems components. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**ED - 1.** Production servers that reside in edge locations are encrypted at the drive level.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level. | No exceptions noted. |
| **CCC-05** Policies and procedures shall be established for managing the risks associated with applying changes to:<br><br>• Business-critical or customer (tenant)-impacting (physical and virtual) applications | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| and system-system interface (API) designs and configurations.<br>• Infrastructure network and systems components.<br>Technical measures shall be implemented to provide assurance that all changes directly correspond to a registered change request, business-critical or customer (tenant), and / or authorization by, the customer (tenant) as per agreement (SLA) prior to deployment. | **CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established. | |

***DSI: Data Security & Information Lifecycle Management, Classification***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **DSI-01** Data and objects containing data shall be assigned a classification by the data owner based on data type, value, sensitivity, and criticality to the organization. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official. | No exceptions noted. |
| **DSI-02** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to inventory, document, and maintain data flows for data that is resident (permanently or temporarily) within the service's geographically distributed (physical and virtual) applications and infrastructure network and systems components and / or shared with other third parties to ascertain | **SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established.<br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| any regulatory, statutory, or supply chain agreement (SLA) compliance impact, and to address any other business risks associated with the data. Upon request, provider shall inform customer (tenant) of compliance impact and risk, especially if customer data is used as part of the services. | obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |
| **DSI-03** Data related to electronic commerce (e-commerce) that traverses public networks shall be appropriately classified and protected from fraudulent activity, unauthorized disclosure, or modification in such a manner to prevent contract dispute and compromise of data. | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented. | No exceptions noted. |
| **DSI-04** Policies and procedures shall be established for the labeling, handling, and security of data and objects which contain data. Mechanisms for label inheritance shall be implemented for objects that act as aggregate containers for data. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br><br>**SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established. | No exceptions noted. |
| **DSI-05** Production data shall not be replicated or used in non-production environments. Any use of customer data in non-production environments requires explicit, documented approval from all customers whose data is affected, and must | **CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| comply with all legal and regulatory requirements for scrubbing of sensitive data elements. | | |
| **DSI-06** All data shall be designated with stewardship, with assigned responsibilities defined, documented, and communicated. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br>**SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established. | No exceptions noted. |
| **DSI-07** Policies and procedures shall be established with supporting business processes and technical measures implemented for the secure disposal and complete removal of data from all storage media, ensuring data is not recoverable by any computer forensic means. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained. | No exceptions noted. |

***DCS: Datacenter Security, Asset Management***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **DCS-01** Assets must be classified in terms of business criticality, service-level expectations, and operational continuity requirements. A complete inventory of business-critical assets located at all sites and / or geographical locations and their usage over time shall be maintained and updated regularly, and assigned ownership by defined roles and responsibilities. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br>**SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established.<br>**SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | authorized by system owners. System components / assets are tracked in the GDCO ticketing database. | |
| **DCS-02** Physical security perimeters (e.g., fences, walls, barriers, guards, gates, electronic surveillance, physical authentication mechanisms, reception desks, and security patrols) shall be implemented to safeguard sensitive data and information systems. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | No exceptions noted. |
| **DCS-03** Automated equipment identification shall be used as a method of connection authentication. Location-aware technologies may be used to validate connection authentication integrity based on known equipment location. | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | No exceptions noted. |
| **DCS-04** Authorization must be obtained prior to relocation or transfer of hardware, software, or data to an offsite premises. | **SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **DCS-05** Policies and procedures shall be established for the secure disposal of equipment (by asset type) used outside the organization's premises. This shall include a wiping solution or destruction process that renders recovery of information impossible. The erasure shall consist of a full overwrite of the drive to ensure that the erased drive is released to inventory for reuse and deployment, or securely stored until it can be destroyed. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained. | No exceptions noted. |
| **DCS-06** Policies and procedures shall be established, and supporting business processes implemented, for maintaining a safe and secure working environment in offices, rooms, facilities, and secure areas storing sensitive information. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 3.** Physical access to the datacenter is reviewed quarterly and verified by the Datacenter Management team.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | No exceptions noted. |
| **DCS-07** Ingress and egress to secure areas shall be constrained and monitored by physical access control mechanisms to ensure that only authorized personnel are allowed access. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **DCS-08** Ingress and egress points such as service areas and other points where unauthorized personnel may enter the premises shall be monitored, controlled and, if possible, isolated from data storage and processing facilities to prevent unauthorized data corruption, compromise, and loss. | **PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | No exceptions noted. |
| **DCS-09** Physical access to information assets and functions by users and support personnel shall be restricted. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel. | No exceptions noted. |

### *EKM: Encryption & Key Management, Entitlement*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **EKM-01** Keys must have identifiable owners (binding keys to identities) and there shall be key management policies. | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures. | **Exception Noted:**<br><br>**DS - 1:**<br><br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Keys must have identifiable owners (binding keys to identities) and key management policies. | not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |
| **EKM-02** Policies and procedures shall be established for the management of cryptographic keys in the service's cryptosystem (e.g., lifecycle management from key generation to revocation and replacement, public key infrastructure, cryptographic protocol design and algorithms used, access controls in place for secure key generation, and exchange and storage including segregation of keys used for encrypted data or sessions). Upon request, provider shall inform the customer (tenant) of changes within the cryptosystem, especially if the customer (tenant) data is used as part of the service, and / or the customer (tenant) has some shared responsibility over implementation of the control. | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | **Exception Noted:**<br><br>**DS - 1:**<br><br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |
| **EKM-03** Policies and procedures shall be established, and supporting business processes and technical measures implemented, for the use of encryption protocols for protection of sensitive data in storage (e.g., file servers, databases, and | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| end-user workstations), data in use (memory), and data in transmission (e.g., system interfaces, over public networks, and electronic messaging) as per applicable legal, statutory, and regulatory compliance obligations. | **DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**LA - 4.** Customer data that is designated as "confidential" is protected while in storage within Azure services.<br><br>**ED - 1.** Production servers that resides in edge locations are encrypted at the drive level. | |
| **EKM-04** Platform and data-appropriate encryption (e.g., AES-256) in open / validated formats and standard algorithms shall be required. Keys shall not be stored in the cloud (i.e. at the cloud provider in question), but maintained by the cloud consumer or trusted key management provider. Key management and key usage shall be separated duties. | **DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies. | No exceptions noted. |

***GRM: Governance and Risk Management, Baseline Requirements***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **GRM-01** Baseline security requirements shall be established for developed or acquired, organizationally-owned or managed, physical or virtual, applications and infrastructure system and network components that comply with applicable legal, statutory and regulatory compliance obligations. Deviations from standard baseline configurations must be authorized | **SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| following change management policies and procedures prior to deployment, provisioning, or use. Compliance with security baseline requirements must be reassessed at least annually unless an alternate frequency has been established and authorized based on business need. | | |
| **GRM-02** Risk assessments associated with data governance requirements shall be<br><br>conducted at planned intervals and shall consider the following:<br><br>• Awareness of where sensitive data is stored and transmitted across<br><br>applications, databases, servers, and network infrastructure<br><br>• Compliance with defined retention periods and end-of-life disposal requirements<br><br>• Data classification and protection from unauthorized use, access, loss, destruction, and falsification | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | No exceptions noted. |
| **GRM-03** Managers are responsible for maintaining awareness of, and complying with, security policies, procedures, and standards that are relevant to their area of responsibility. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **GRM-04** An Information Security Management Program (ISMP) shall be developed, documented, approved, and implemented that includes administrative, technical, and physical safeguards to protect assets and data from loss, misuse, unauthorized access, disclosure, alteration, and destruction. The security program shall include, but not be limited to, the following areas insofar as they relate to the characteristics of the business:<br>• Risk management<br>• Security policy<br>• Organization of information security<br>• Asset management<br>• Human resources security<br>• Physical and environmental security<br>• Communications and operations management<br>• Access control<br>• Information systems acquisition, development, and maintenance | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | No exceptions noted. |
| **GRM-05** Executive and line management shall take formal action to support information security through clearly-documented direction and commitment, and shall ensure the action has been assigned. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | |
| **GRM-06** Information security policies and procedures shall be established and made readily available for review by all impacted personnel and external business relationships. Information security policies must be authorized by the organization's business leadership (or other accountable business role or function) and supported by a strategic business plan and an information security management program inclusive of defined information security roles and responsibilities for business leadership. | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |
| **GRM-07** A formal disciplinary or sanction policy shall be established for employees who have violated security policies and procedures. Employees shall be made aware of what action might be taken in the event of a violation, and disciplinary measures must be stated in the policies and procedures. | **SOC2 - 11.** Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy. | No exceptions noted. |
| **GRM-08** Risk assessment results shall include updates to security policies, procedures, standards, and controls to ensure that they remain relevant and effective. | **IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |
| **GRM-09** The organization's business leadership (or other accountable business role or function) shall review the information security policy at planned intervals or as a result of changes to the organization to ensure its continuing alignment with the security strategy, effectiveness, accuracy, relevance, and applicability to legal, statutory, or regulatory compliance obligations. | **IS - 2.** The Security Policy is reviewed and approved annually by appropriate management. | No exceptions noted. |
| **GRM-10** Aligned with the enterprise-wide framework, formal risk assessments shall be performed at least annually or at planned intervals, (and in conjunction with any changes to information systems) to determine the likelihood and impact of all identified risks using qualitative and quantitative methods. The likelihood and impact associated with inherent and residual risk shall be determined independently, considering all risk categories (e.g., audit results, threat and vulnerability analysis, and regulatory compliance). | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | |
| **GRM-11** Risks shall be mitigated to an acceptable level. Acceptance levels based on risk criteria shall be established and documented in accordance with reasonable resolution time frames and stakeholder approval. | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | No exceptions noted. |

***HRS: Human Resources, Asset Returns***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **HRS-01** Upon termination of workforce personnel and / or expiration of external business relationships, all organizationally-owned assets shall be returned within an established period. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |
| **HRS-02** Pursuant to local laws, regulations, ethics, and contractual constraints, all employment candidates, contractors, and third parties shall be subject to background | **SOC2 - 12.** Microsoft personnel and contingent staff undergo formal screening, including background verification checks, as a part of the hiring process prior to being granted access. Additional screening is conducted in accordance with customer specific requirements, for employees with access to applicable data. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| verification proportional to the data classification to be accessed, the business requirements, and acceptable risk. | | |
| **HRS-03** Employment agreements shall incorporate provisions and / or terms for adherence to established information governance and security policies and must be signed by newly hired or on-boarded workforce personnel (e.g., full or part-time employee or contingent staff) prior to granting workforce personnel user access to corporate facilities, resources, and assets. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | No exceptions noted. |
| **HRS-04** Roles and responsibilities for performing employment termination or change in employment procedures shall be assigned, documented, and communicated. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |
| **HRS-05** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to manage business risks associated with permitting mobile device access to corporate resources and may require the implementation of higher assurance compensating controls and acceptable-use policies and procedures (e.g., mandated security training, stronger identity, entitlement and access controls, and device monitoring). | **CCM - 1.** Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment.<br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **HRS-06** Requirements for non-disclosure or confidentiality agreements reflecting the organization's needs for the protection of data and operational details shall be identified, documented, and reviewed at planned intervals. | **SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | No exceptions noted. |
| **HRS-07** Roles and responsibilities of contractors, employees, and third-party users shall be documented as they relate to information assets and security. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |
| **HRS-08** Policies and procedures shall be established, and supporting business processes and technical measures implemented, for defining allowances and conditions for permitting usage of organizationally-owned or managed user end-point devices (e.g., issued workstations, laptops, and mobile devices) and IT infrastructure network and systems components. Additionally, defining allowances and conditions to permit usage of personal mobile devices and associated applications with access to corporate resources (i.e., BYOD) shall be considered and incorporated as appropriate. | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br>**CCM - 1.** Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment. | No exceptions noted. |
| **HRS-09** A security awareness training program shall be established for all contractors, third-party users, and employees of the organization and mandated when appropriate. All individuals with access | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| to organizational data shall receive appropriate awareness training and regular updates in organizational procedures, processes, and policies relating to their professional function relative to the organization. | | |
| **HRS-10** All personnel shall be made aware of their roles and responsibilities for:<br>• Maintaining awareness and compliance with established policies and procedures and applicable legal, statutory, or regulatory compliance obligations.<br>• Maintaining a safe and secure working environment | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |
| **HRS-11** Policies and procedures shall be established to require that unattended workspaces do not have openly visible (e.g., on a desktop) sensitive documents and user computing sessions are disabled after an established period of inactivity. | **CCM - 2.** Microsoft Azure has included a clear desk and clear screen policy which users are provided as a part of onboarding. | No exceptions noted. |

***IAM: Identity & Access Management, Audit Tools Access***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **IAM-01** Access to, and use of, audit tools that interact with the organization's information systems shall be appropriately segregated and access restricted to prevent | **CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| inappropriate disclosure and tampering of log data. | | |
| **IAM-02** User access policies and procedures shall be established, and supporting business processes and technical measures implemented, for ensuring appropriate identity, entitlement, and access management for all internal corporate and customer (tenant) users with access to data and organizationally-owned or managed (physical and virtual) application interfaces and infrastructure network and systems components. These policies, procedures, processes, and measures must incorporate the following:<br>• Procedures and supporting roles and responsibilities for provisioning and de-provisioning user account entitlements following the rule of least privilege based on job function (e.g., internal employee and contingent staff personnel changes, customer-controlled access, suppliers' business relationships, or other third-party business relationships)<br>• Business case considerations for higher levels of assurance and multi-factor authentication secrets (e.g., management interfaces, key generation, remote access, segregation of duties, emergency access, large-scale provisioning or geographically-distributed deployments, and personnel redundancy for critical systems) | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented.<br>**LA - 5.** User sessions within Azure can be configured by customers to expire after a stipulated period of inactivity.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br>**OA - 21.** Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| • Access segmentation to sessions and data in multi-tenant architectures by any third party (e.g., provider and / or other customer (tenant))<br>• Identity trust verification and service-to-service application (API) and information processing interoperability (e.g., SSO and federation)<br>• Account credential lifecycle management from instantiation through revocation<br>• Account credential and / or identity store minimization or re-use when feasible<br>• Authentication, authorization, and accounting (AAA) rules for access to data and sessions (e.g., encryption and strong / multi-factor, expireable, non-shared authentication secrets)<br>• Permissions and supporting capabilities for customer (tenant) controls over authentication, authorization, and accounting (AAA) rules for access to data and sessions<br>• Adherence to applicable legal, statutory, or regulatory compliance requirements | **PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals. | |
| **IAM-03** User access to diagnostic and configuration ports shall be restricted to authorized individuals and applications. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription. | |
| **IAM-04** Policies and procedures shall be established to store and manage identity information about every person who accesses IT infrastructure and to determine their level of access. Policies shall also be developed to control access to network resources based on user identity. | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br><br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription. | No exceptions noted. |
| **IAM-05** User access policies and procedures shall be established, and supporting business processes and technical measures implemented, for restricting user access as per defined segregation of duties to address business risks associated with a user-role conflict of interest. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established. | |
| **IAM-06** Access to the organization's own developed applications, program, or object source code, or any other form of intellectual property (IP), and use of proprietary software shall be appropriately restricted following the rule of least privilege based on job function as per established user access policies and procedures. | **CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**SDL - 5.** A centralized repository for managing source code changes to the Azure platform is used. Procedures to authorize Azure personnel to submit source code changes based on their role, are established. Code changes submitted to the centralized repository are logged and can be traced to the individuals or system components executing them. | No exceptions noted. |
| **IAM-07** The identification, assessment, and prioritization of risks posed by business processes requiring third-party access to the organization's information systems and data shall be followed by coordinated application of resources to minimize, monitor, and measure likelihood and impact of unauthorized or inappropriate access. Compensating controls derived from the risk analysis shall be implemented prior to provisioning access. | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**C5 - 2.** Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually. | No exceptions noted. |
| **IAM-08** Policies and procedures are established for permissible storage and access of identities used for authentication to ensure identities are only accessible based on rules of least privilege and replication | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis. | **Exception Noted:**<br>**DS - 1:**<br>One of 15 sampled secrets during the portion of the period April 1, |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| limitation only to users explicitly defined as business necessary. | **DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |
| **IAM-09** Provisioning user access (e.g., employees, contractors, customers (tenants), business partners and / or supplier relationships) to data and organizationally-owned or managed (physical and virtual) applications, infrastructure systems, and network components shall be authorized by the organization's management prior to access being granted and appropriately restricted as per established policies and procedures. Upon request, provider shall inform customer (tenant) of this user access, especially if customer (tenant) data is used as part the service and / or customer (tenant) has some shared responsibility over implementation of control. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |
| **IAM-10** User access shall be authorized and revalidated for entitlement appropriateness, at planned intervals, by the organization's business leadership or other accountable business role or function supported by evidence to demonstrate the organization is adhering to the rule of least privilege based on job function. For identified access violations, remediation must follow established user access policies and procedures. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews. | No exceptions noted. |
| **IAM-11** Timely de-provisioning (revocation or modification) of user access to data and organizationally-owned or managed (physical and virtual) applications, infrastructure systems, and network components, shall be implemented as per established policies and procedures and based on user's change in status (e.g., termination of employment or other business relationship, job change or transfer). Upon request, provider shall inform customer (tenant) of these changes, especially if customer (tenant) data is used as part the service and / or customer (tenant) has some shared responsibility over implementation of control. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | obligations of Azure customers are updated on the Azure website in a timely manner. | revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |
| **IAM-12** Internal corporate or customer (tenant) user account credentials shall be restricted as per the following, ensuring appropriate identity, entitlement, and access management and in accordance with established policies and procedures:<br><br>• Identity trust verification and service-to-service application (API) and information processing interoperability (e.g., SSO and Federation)<br><br>• Account credential lifecycle management from instantiation through revocation<br><br>• Account credential and / or identity store minimization or re-use when feasible<br><br>• Adherence to industry acceptable and / or regulatory compliant authentication, authorization, and accounting (AAA) rules (e.g., strong / multi-factor, expirable, non-shared authentication secrets) | **LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br><br>- expiration<br>- length<br>- complexity<br>- history<br><br>Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**OA - 21.** Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **IAM-13** Utility programs capable of potentially overriding system, object, network, virtual machine, and application controls shall be restricted. | **SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | No exceptions noted. |

***IVS: Infrastructure & Virtualization Security, Audit Logging / Intrusion Detection***

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **IVS-01** Higher levels of assurance are required for protection, retention, and lifecycle management of audit logs, adhering to applicable legal, statutory or regulatory compliance obligations and providing unique user access accountability to detect potentially suspicious network behaviors and / or file integrity anomalies, and to support forensic investigative capabilities in the event of a security breach. | **CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems. | No exceptions noted. |
| **IVS-02** The provider shall ensure the integrity of all virtual machine images at all times. Any changes made to virtual machine images must be logged and an alert raised regardless of their running state (e.g., dormant, off, or running). The results of a change or move of an image and the subsequent validation of the image's integrity must be immediately available to | **CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| customers through electronic methods (e.g., portals or alerts). | Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**ED - 2.** Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected. | |
| **IVS-03** A reliable and mutually agreed upon external time source shall be used to synchronize the system clocks of all relevant information processing systems to facilitate tracing and reconstitution of activity timelines. | **CCM - 4.** Microsoft Azure components are configured to use Coordinated Universal Time (UTC) time and the clocks are synchronized with the domain controller server. | No exceptions noted. |
| **IVS-04** The availability, quality, and adequate capacity and resources shall be planned, prepared, and measured to deliver the required system performance in accordance with legal, statutory, and regulatory compliance obligations. Projections of future capacity requirements shall be made to mitigate the risk of system overload. | **BC - 10.** The network is monitored to ensure availability and address capacity issues in a timely manner.<br><br>**CCM - 5.** Microsoft Capacity Management team projects future capacity requirements based on internal operational reports, revenue forecasts and inputs from internal component teams.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | **VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |
| **IVS-05** Implementers shall ensure that the security vulnerability assessment tools or services accommodate the virtualization technologies used (e.g., virtualization aware). | **VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | No exceptions noted. |
| **IVS-06** Network environments and virtual instances shall be designed and configured to restrict and monitor traffic between trusted and untrusted connections. These configurations shall be reviewed at least annually, and supported by a documented justification for use for all allowed services, protocols, and ports, and by compensating controls. | **OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**OA - 18.** Azure network is segregated to separate customer traffic from management traffic.<br><br>**VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **IVS-07** Each operating system shall be hardened to provide only necessary ports, protocols, and services to meet business needs and have in place supporting technical controls such as: antivirus, file integrity monitoring, and logging as part of their baseline operating build standard or template. | **SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**ED - 3.** All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level. | No exceptions noted. |
| **IVS-08** Production and non-production environments shall be separated to prevent unauthorized access or changes to information assets. Separation of the environments may include: stateful inspection firewalls, domain / realm authentication sources, and clear segregation of duties for personnel accessing these environments as part of their job duties. | **CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br><br>**SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams.<br><br>**SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments. | No exceptions noted. |
| **IVS-09** Multi-tenant organizationally-owned or managed (physical and virtual) applications, and infrastructure system and network components, shall be designed, developed, deployed and configured such that provider and customer (tenant) user access is appropriately segmented from other tenant users, based on the following considerations:<br><br>• Established policies and procedures<br><br>• Isolation of business critical assets and / or sensitive user data, and sessions that | **DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| mandate stronger internal controls and high levels of assurance<br>• Compliance with legal, statutory and regulatory compliance obligations | | |
| **IVS-10** Secured and encrypted communication channels shall be used when migrating physical servers, applications, or data to virtualized servers and, where possible, shall use a network segregated from production-level networks for such migrations. | **DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br>**OA - 18.** Azure network is segregated to separate customer traffic from management traffic. | No exceptions noted. |
| **IVS-11** Access to all hypervisor management functions or administrative consoles for systems hosting virtualized systems shall be restricted to personnel based upon the principle of least privilege and supported through technical controls (e.g., two-factor authentication, audit trails, IP address filtering, firewalls, and TLS encapsulated communications to the administrative consoles). | **DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br>**OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br>**VM - 2.** Administrator activity in the Azure platform is logged. | No exceptions noted. |
| **IVS-12** Policies and procedures shall be established, and supporting business processes and technical measures | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| implemented, to protect wireless network environments, including the following:<br>• Perimeter firewalls implemented and configured to restrict unauthorized traffic<br>• Security settings enabled with strong encryption for authentication and transmission, replacing vendor default settings (e.g., encryption keys, passwords, and SNMP community strings)<br>• User access to wireless network devices restricted to authorized personnel<br>• The capability to detect the presence of unauthorized (rogue) wireless network devices for a timely disconnect from the network | Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards. | |
| **IVS-13** Network architecture diagrams shall clearly identify high-risk environments and data flows that may have legal compliance impacts. Technical measures shall be implemented and shall apply defense-in-depth techniques (e.g., deep packet analysis, traffic throttling, and black-holing) for detection and timely response to network-based attacks associated with anomalous ingress or egress traffic patterns (e.g., MAC spoofing and ARP poisoning attacks) and / or distributed denial-of-service (DDoS) attacks. | **OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment.<br>**SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users.<br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards. | No exceptions noted. |

## *IPY: Interoperability & Portability, APIs*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **IPY-01** The provider shall use open and published APIs to ensure support for interoperability between components and to facilitate migrating applications. | **CCM - 6.** Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Azure Portal. | No exceptions noted. |
| **IPY-02** All structured and unstructured data shall be available to the customer and provided to them upon request in an industry-standard format (e.g., .doc, .xls, .pdf, logs, and flat files) | **SOC2 - 28.** Customer data is accessible within agreed upon services in data formats compatible with providing those services. | No exceptions noted. |
| **IPY-03** Policies, procedures, and mutually-agreed upon provisions and / or terms shall be established to satisfy customer (tenant) requirements for service-to-service application (API) and information processing interoperability, and portability for application development and information exchange, usage, and integrity persistence. | **CCM - 6.** Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Azure Portal. | No exceptions noted. |
| **IPY-04** The provider shall use secure (e.g., non-clear text and authenticated) standardized network protocols for the import and export of data and to manage the service, and shall make available a document to consumers (tenants) detailing the relevant interoperability and portability standards that are involved. | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | **OA - 17.** External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols.<br><br>**SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users. | |
| **IPY-05** The provider shall use an industry-recognized virtualization platform and standard virtualization formats (e.g., OVF) to help ensure interoperability, and shall have documented custom changes made to any hypervisor in use and all solution-specific virtualization hooks available for customer review. | **OA - 19.** Microsoft Azure has published virtualization industry standards supported within its environment. | No exceptions noted. |

### *MOS: Mobile Security, Anti-Malware*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| MOS Criteria - Not Applicable as Microsoft Azure does not support access to production assets through mobile devices. Production assets are accessed through Secure Access Workstations. | | |

### *SEF: Security Incident Management, E-Discovery & Cloud Forensics, Contact / Authority Maintenance*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **SEF-01** Points of contact for applicable regulation authorities, national and local law enforcement, and other legal jurisdictional authorities shall be maintained and regularly | **IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| updated (e.g., change in impacted-scope and / or a change in any compliance obligation) to ensure direct compliance liaisons have been established and to be prepared for a forensic investigation requiring rapid engagement with law enforcement. | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements.<br><br>**CCM - 9.** Microsoft Azure has established forensic procedures to support potential legal action after an information security incident. | |
| **SEF-02** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to triage security-related events and ensure timely and thorough incident management, as per established IT service management policies and procedures. | **IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | No exceptions noted. |
| **SEF-03** Workforce personnel and external business relationships shall be informed of their responsibilities and, if required, shall consent and / or contractually agree to report all information security events in a timely manner. Information security events shall be reported through predefined communications channels in a timely manner adhering to applicable legal, statutory, or regulatory compliance obligations. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | |
| **SEF-04** Proper forensic procedures, including chain of custody, are required for the presentation of evidence to support potential legal action subject to the relevant jurisdiction after an information security incident. Upon notification, customers and / or other external business partners impacted by a security breach shall be given the opportunity to participate as is legally permissible in the forensic investigation. | **CCM - 9.** Microsoft Azure has established forensic procedures to support potential legal action after an information security incident.<br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | No exceptions noted. |
| **SEF-05** Mechanisms shall be put in place to monitor and quantify the types, volumes, and costs of information security incidents. | **IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures. | No exceptions noted. |

### *STA: Supply Chain Management, Transparency and Accountability, Data Quality and Integrity*

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **STA-01** Providers shall inspect, account for, and work with their cloud supply-chain partners to correct data quality errors and associated risks. Providers shall design and | **CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| implement controls to mitigate and contain data security risks through proper separation of duties, role-based access, and least-privilege access for all personnel within their supply chain. | **CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams.<br><br>**SDL - 5.** A centralized repository for managing source code changes to the Azure platform is used. Procedures to authorize Azure personnel to submit source code changes based on their role, are established. Code changes submitted to the centralized repository are logged and can be traced to the individuals or system components executing them.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |
| **STA-02** The provider shall make security incident information available to all affected customers and providers periodically through electronic methods (e.g., portals). | **SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner. | No exceptions noted. |
| **STA-03** Business-critical or customer (tenant) impacting (physical and virtual) application and system-system interface (API) designs and configurations, and infrastructure network and systems | **SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| components, shall be designed, developed, and deployed in accordance with mutually agreed-upon service and capacity-level expectations, as well as IT governance and service management policies and procedures. | **SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment.<br><br>**SDL - 7.** The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners. | |
| **STA-04** The provider shall perform annual internal assessments of conformance to, and effectiveness of, its policies, procedures, and supporting measures and metrics. | **IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | No exceptions noted. |
| **STA-05** Supply chain agreements (e.g., SLAs) between providers and customers (tenants) shall incorporate at least the following mutually-agreed upon provisions and / or terms:<br><br>• Scope of business relationship and services offered (e.g., customer (tenant) data acquisition, exchange and usage, feature sets and functionality, personnel and infrastructure network and systems components for service delivery and support, roles and responsibilities of provider and customer (tenant) and any subcontracted or outsourced business relationships, physical geographical location of hosted services, and | **SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
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| any known regulatory compliance considerations)<br><br>• Information security requirements, provider and customer (tenant) primary points of contact for the duration of the business relationship, and references to detailed supporting and relevant business processes and technical measures implemented to enable effectively governance, risk management, assurance and legal, statutory and regulatory compliance obligations by all impacted business relationships<br><br>• Notification and / or pre-authorization of any changes controlled by the provider with customer (tenant) impacts<br><br>• Timely notification of a security incident (or confirmed breach) to all customers (tenants) and other business relationships impacted (i.e., up- and down-stream impacted supply chain)<br><br>• Assessment and independent verification of compliance with agreement provisions and / or terms (e.g., industry-acceptable certification, attestation audit<br><br>report, or equivalent forms of assurance) without posing an unacceptable business risk of exposure to the organization being assessed<br><br>• Expiration of the business relationship and treatment of customer (tenant) data impacted | | |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| • Customer (tenant) service-to-service application (API) and data interoperability and portability requirements for application development and information exchange, usage, and integrity persistence | | |
| **STA-06** Providers shall review the risk management and governance processes of their partners so that practices are consistent and aligned to account for risks inherited from other members of that partner's cloud supply chain. | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**C5 - 2.** Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually. | No exceptions noted. |
| **STA-07** Policies and procedures shall be implemented to ensure the consistent review of service agreements (e.g., SLAs) between providers and customers (tenants) across the relevant supply chain (upstream / downstream). Reviews shall be performed at least annually and identify any non-conformance to established agreements. The reviews should result in actions to address service-level conflicts or inconsistencies resulting from disparate supplier relationships. | **BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | No exceptions noted. |
| **STA-08** Providers shall assure reasonable information security across their information supply chain by performing an annual review. The review shall include all partners / | **BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| third party-providers upon which their information supply chain depends on. | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |
| **STA-09** Third-party service providers shall demonstrate compliance with information security and confidentiality, access control, service definitions, and delivery level agreements included in third-party contracts. Third-party reports, records, and services shall undergo audit and review at least annually to govern and maintain compliance with the service delivery agreements. | **BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | No exceptions noted. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| **TVM-01** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to prevent the execution of malware on organizationally-owned or managed user end-point devices (i.e., issued workstations, laptops, and mobile devices) and IT infrastructure network and systems components. | **SDL - 6.** Source code builds are scanned for malware prior to release to production.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented. | No exceptions noted. |
| **TVM-02** Policies and procedures shall be established, and supporting processes and technical measures implemented, for timely detection of vulnerabilities within organizationally-owned or managed applications, infrastructure network and system components (e.g., network vulnerability assessment, penetration testing) to ensure the efficiency of implemented security controls. A risk-based model for prioritizing remediation of identified vulnerabilities shall be used. Changes shall be managed through a change management process for all vendor-supplied patches, configuration changes, or changes to the organization's internally developed software. Upon request, the provider informs customer (tenant) of policies and procedures and identified weaknesses especially if customer (tenant) data is used as part the service and / or customer (tenant) has some shared responsibility over implementation of control. | **SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| CCM Criteria | Azure Activity | Test Result |
|---|---|---|
| | **CM - 8.** The Technical Security Services team develops security configuration standards for systems in the physical environment that are consistent with industry-accepted hardening standards. These configurations are documented in system baselines, are reviewed annually, and relevant configuration changes are communicated to impacted teams.<br><br>**CM - 10.** Secure configurations for datacenter software are applied through defined change management procedures including documentation, testing and approval. | |
| **TVM-03** Policies and procedures shall be established, and supporting business processes and technical measures implemented, to prevent the execution of unauthorized mobile code, defined as software transferred between systems over a trusted or untrusted network and executed on a local system without explicit installation or execution by the recipient, on organizationally-owned or managed user end-point devices (e.g., issued workstations, laptops, and mobile devices) and IT infrastructure network and systems components. | **VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented. | No exceptions noted. |

## Part C: C5 Criteria, Control Activities provided by Microsoft, and Test Results provided by Deloitte & Touche LLP

### *OIS: Organization of Information Security*

**Control Objective 6.1:** Plan, implement, maintain and continuously improve the information security framework within the organisation.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **OIS-01** The Cloud Service Provider operates an information security management system (ISMS) in accordance with ISO/IEC 27001. The scope of the ISMS covers the Cloud Service Provider's organisational units, locations and procedures for providing the cloud service.<br><br>The measures for setting up, implementing, maintaining and continuously improving the ISMS are documented.<br><br>The documentation includes:<br><br>• Scope of the ISMS (Section 4.3 of ISO/IEC 27001);<br><br>• Declaration of applicability (Section 6.1.3), and<br><br>• Results of the last management review (Section 9.3). | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | No exceptions noted. |
| **OIS-02** The top management of the Cloud Service Provider has adopted an information security policy and communicated it to internal and external employees as well as cloud customers.<br><br>The policy describes:<br><br>• the importance of information security, based on the requirements of cloud customers in relation to information security;<br><br>• the security objectives and the desired security level, based on the business goals and tasks of the Cloud Service Provider; | **IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • the most important aspects of the security strategy to achieve the security objectives set; and<br>• the organisational structure for information security in the ISMS application area. | | |
| **OIS-03** Interfaces and dependencies between cloud service delivery activities performed by the Cloud Service Provider and activities performed by third parties are documented and communicated. This includes dealing with the following events:<br>• Vulnerabilities;<br>• Security incidents; and<br>• Malfunctions.<br>The type and scope of the documentation is geared towards the information requirements of the subject matter experts of the affected organisations in order to carry out the activities appropriately (e.g. definition of roles and responsibilities in guidelines, description of cooperation obligations in service descriptions and contracts).<br>The communication of changes to the interfaces and dependencies takes place in a timely manner so that the affected organisations and third parties can react appropriately with organisational and technical measures before the changes take effect. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures.<br>**SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **OIS-04** Conflicting tasks and responsibilities are separated based on an OIS-06 risk assessment to reduce the risk of unauthorised or unintended changes or misuse of cloud customer data processed, stored or transmitted in the cloud service.<br><br>The risk assessment covers the following areas, insofar as these are applicable to the provision of the Cloud Service and are in the area of responsibility of the Cloud Service Provider:<br><br>• Administration of rights profiles, approval and assignment of access and access authorisations (cf. IDM-01);<br><br>• Development, testing and release of changes (cf. DEV-01); and<br><br>• Operation of the system components.<br><br>If separation cannot be established for organisational or technical reasons, measures are in place to monitor the activities in order to detect unauthorised or unintended changes as well as misuse and to take appropriate actions. | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br><br>**CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 12.** Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information.<br><br>**CM - 13.** Any changes to production via break-glass have been reviewed to ensure all changes were appropriate.<br><br>**SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams.<br><br>**PI - 4.** Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | **Exception Noted:**<br><br>**CM - 13:**<br><br>For six of the total population of 100 break-glass alerts, evidence of review by a team member who did not perform the break-glass operation was not retained to verify if appropriate changes were made to the production environment. |
| **OIS-05** The Cloud Service Provider leverages relevant authorities and interest groups in order to stay informed about current threats and vulnerabilities. The | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| information flows into the procedures for handling risks (cf. OIS-06) and vulnerabilities (cf. OPS-19). | and the organization, should be explicitly defined, documented, and kept up to date.<br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements. | |
| **OIS-06** Policies and instructions for risk management procedures are documented, communicated and provided in accordance with SP-01 for the following aspects:<br>• Identification of risks associated with the loss of confidentiality, integrity, availability and authenticity of information within the scope of the ISMS and assigning risk owners;<br>• Analysis of the probability and impact of occurrence and determination of the level of risk;<br>• Evaluation of the risk analysis based on defined criteria for risk acceptance and prioritisation of handling;<br>• Handling of risks through measures, including approval of authorisation and acceptance of residual risks by risk owners; and<br>• Documentation of the activities implemented to enable consistent, valid and comparable results. | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management. | No exceptions noted. |
| **OIS-07** The Cloud Service Provider executes the process for handling risks as needed or at least once a year. The following aspects | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| are taken into account when identifying risks, insofar as they are applicable to the cloud service provided and are within the area of responsibility of the Cloud Service Provider:<br>• Processing, storage or transmission of data of cloud customers with different protection needs;<br>• Occurrence of weak points and malfunctions in technical protective measures for separating shared resources;<br>• Attacks via access points, including interfaces accessible from public networks;<br>• Conflicting tasks and areas of responsibility that cannot be separated for organisational or technical reasons; and<br>• Dependencies on subservice organisations.<br>The analysis, evaluation and treatment of risks, including the approval of actions and acceptance of residual risks, is reviewed for adequacy at least annually by the risk owners. | responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br>**ELC - 9.** The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management. | |

### *SP: Security Policies and Instructions*

**Control Objective 6.2:** Provide policies and instructions regarding security requirements and to support business requirements.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **SP-01.** Policies and instructions (incl. concepts and guidelines) are derived from the information security policy and are documented according to a uniform structure. They are communicated and made available to all internal and external employees of the Cloud Service Provider in an appropriate manner<br><br>The policies and instructions are version controlled and approved by the top management of the Cloud Service Provider or an authorised body<br><br>The policies and instructions describe at least the following aspects:<br>• Objectives;<br>• Scope;<br>• Roles and responsibilities, including staff qualification requirements and the establishment of substitution rules;<br>• Roles and dependencies on other organisations (especially cloud customers and subservice organisations);<br>• Steps for the execution of the security strategy; and<br>• Applicable legal and regulatory requirements. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated.<br><br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br><br>**IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date. | No exceptions noted. |
| **SP-02.** Information security policies and instructions are reviewed at least annually | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| for adequacy by the Cloud Service Provider's subject matter experts.<br><br>The review shall consider at least the following aspects:<br><br>• Organisational and technical changes in the procedures for providing the cloud service; and<br><br>• Legal and regulatory changes in the Cloud Service Provider's environment.<br><br>Revised policies and instructions are approved before they become effective. | and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**IS - 2.** The Security Policy is reviewed and approved annually by appropriate management.<br><br>**SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | |
| **SP-03** Exceptions to the policies and instructions for information security as well as respective controls go through the OIS-06 risk management process, including approval of these exceptions and acceptance of the associated risks by the risk owners. The approvals of exceptions are documented, limited in time and are reviewed for appropriateness at least annually by the risk owners. | **SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | No exceptions noted. |

### *HR: Personnel*

**Control Objective 6.3:** Ensure that employees understand their responsibilities, are aware of their responsibilities with regard to information security, and that the organisation's assets are protected in the event of changes in responsibilities or termination.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **HR-01** The competency and integrity of all internal and external employees of the Cloud Service Provider with access to cloud customer data or system components under the Cloud Service Provider's responsibility who are responsible to provide the cloud service in the production environment shall be verified prior to commencement of employment in accordance with local legislation and regulation by the Cloud Service Provider.<br><br>To the extent permitted by law, the review will cover the following areas:<br><br>• Verification of the person through identity card;<br><br>• Verification of the CV;<br><br>• Verification of academic titles and degrees;<br><br>• Request of a police clearance certificate for applicants;<br><br>• Certificate of good conduct or national equivalent; and<br><br>• Evaluation of the risk to be blackmailed. | **SOC2 - 12.** Microsoft personnel and contingent staff undergo formal screening, including background verification checks, as a part of the hiring process prior to being granted access. Additional screening is conducted in accordance with customer specific requirements, for employees with access to applicable data. | No exceptions noted. |
| **HR-02** The Cloud Service Provider's internal and external employees are required by the employment terms and conditions to comply | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| with applicable policies and instructions relating to information security.<br><br>The information security policy, and the policies and instructions based on it, are to be acknowledged by the internal and external personnel in a documented form before access is granted to any cloud customer data or system components under the responsibility of the Cloud Service Provider used to provide the cloud service in the production environment. | describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | |
| **HR-03** The Cloud Service Provider operates a target group-oriented security awareness and training program, which is completed by all internal and external employees of the Cloud Service Provider on a regular basis. The program is regularly updated based on changes to policies and instructions and the current threat situation and includes the following aspects:<br><br>• Handling system components used to provide the cloud service in the production environment in accordance with applicable policies and procedures;<br><br>• Handling cloud customer data in accordance with applicable policies and instructions and applicable legal and regulatory requirements;<br><br>• Information about the current threat situation; and | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br><br>**ELC - 6.** Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Correct behaviour in the event of security incidents. | | |
| **HR-04** In the event of violations of policies and instructions or applicable legal and regulatory requirements, actions are taken in accordance with a defined policy that includes the following aspects:<br>• Verifying whether a violation has occurred; and<br>• Consideration of the nature and severity of the violation and its impact.<br>The internal and external employees of the Cloud Service Provider are informed about possible disciplinary measures.<br>The use of disciplinary measures is appropriately documented. | **SOC2 - 11.** Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy. | No exceptions noted. |
| **HR-05** Internal and external employees have been informed about which responsibilities, arising from the guidelines and instructions relating to information security, will remain in place when their employment is terminated or changed and for how long. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | No exceptions noted. |
| **HR-06** The non-disclosure or confidentiality agreements to be agreed with internal employees, external service providers and | **SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| suppliers of the Cloud Service Provider are based on the requirements identified by the Cloud Service Provider for the protection of confidential information and operational details.<br><br>The agreements are to be accepted by external service providers and suppliers when the contract is agreed. The agreements must be accepted by internal employees of the Cloud Service Provider before authorisation to access data of cloud customers is granted.<br><br>The requirements must be documented and reviewed at regular intervals (at least annually). If the review shows that the requirements need to be adapted, the non-disclosure or confidentiality agreements are updated.<br><br>The Cloud Service Provider must inform the internal employees, external service providers and suppliers and obtain confirmation of the updated confidentiality or non-disclosure agreement. | and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | |

### *AM: Asset Management*

**Control Objective 6.4:** Identify the organisation's own assets and ensure an appropriate level of protection throughout their lifecycle.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **AM-01** The Cloud Service Provider has established procedures for inventorying assets.<br><br>The inventory is performed automatically and/or by the people or teams responsible for the assets to ensure complete, accurate, valid and consistent inventory throughout the asset lifecycle.<br><br>Assets are recorded with the information needed to apply the Risk Management Procedure (Cf. OIS-07), including the measures taken to manage these risks throughout the asset lifecycle. Changes to this information are logged. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br><br>**SOC2 - 2.** Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established. | No exceptions noted. |
| **AM-02** Policies and instructions for acceptable use and safe handling of assets are documented, communicated and provided in accordance with SP-01 and address the following aspects of the asset lifecycle as applicable to the asset:<br><br>• Approval procedures for acquisition, commissioning, maintenance, decommissioning, and disposal by authorised personnel or system components;<br><br>• Inventory;<br><br>• Classification and labelling based on the need for protection of the information and measures for the level of protection identified; | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official.<br><br>**CCM - 1.** Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| • Secure configuration of mechanisms for error handling, logging, encryption, authentication and authorisation;<br>• Requirements for versions of software and images as well as application of patches;<br>• Handling of software for which support and security patches are not available anymore;<br>• Restriction of software installations or use of services;<br>• Protection against malware;<br>• Remote deactivation, deletion or blocking;<br>• Physical delivery and transport;<br>• Dealing with incidents and vulnerabilities; and<br>• Complete and irrevocable deletion of the data upon decommissioning. | | |
| **AM-03** The Cloud Service Provider has an approval process for the use of hardware to be commissioned, which is used to provide the cloud service in the production environment, in which the risks arising from the commissioning are identified, analysed and mitigated. Approval is granted after verification of the secure configuration of the mechanisms for error handling, logging, encryption, authentication and authorisation according to the intended use and based on the applicable policies. | **CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br>**CM - 8.** The Technical Security Services team develops security configuration standards for systems in the physical environment that are consistent with industry-accepted hardening standards. These configurations are documented in system baselines, are reviewed annually, and relevant configuration changes are communicated to impacted teams.<br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **AM-04** The decommissioning of hardware used to operate system components supporting the cloud service production environment under the responsibility of the Cloud Service Provider requires approval based on the applicable policies.<br><br>The decommissioning includes the complete and permanent deletion of the data or proper destruction of the media. | **SOC2 - 3.** Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are tracked in the GDCO ticketing database.<br><br>**DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures. | No exceptions noted. |
| **AM-05** The Cloud Service Provider's internal and external employees are provably committed to the policies and instructions for acceptable use and safe handling of assets before they can be used if the Cloud Service Provider has determined in a risk assessment that loss or unauthorised access could compromise the information security of the Cloud Service.<br><br>Any assets handed over are provably returned upon termination of employment. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**CCM - 1.** Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment. | No exceptions noted. |
| **AM-06** Assets are classified and, if possible, labelled. Classification and labelling of an asset reflects the protection needs of the information it processes, stores, or transmits. | **SOC2 - 1.** Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| The need for protection is determined by the individuals or groups responsible for the assets of the Cloud Service Provider according to a uniform schema. The schema provides levels of protection for the confidentiality, integrity, availability, and authenticity protection objectives. | **CCM - 1.** Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment. | |

### *PS: Physical Security*

**Control Objective 6.5:** Prevent unauthorised physical access and protect against theft, damage, loss and outage of operations.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **PS-01** Security requirements for premises and buildings related to the cloud service provided, are based on the security objectives of the information security policy, identified protection requirements for the cloud service and the assessment of risks to physical and environmental security. The security requirements are documented, communicated and provided in a policy or concept according to SP-01.<br><br>The security requirements for data centres are based on criteria which comply with established rules of technology. They are suitable for addressing the following risks in accordance with the applicable legal and contractual requirements: | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures.<br><br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Faults in planning;<br>• Unauthorised access;<br>• Insufficient surveillance;<br>• Insufficient air-conditioning;<br>• Fire and smoke;<br>• Water;<br>• Power failure; and<br>• Air ventilation and filtration.<br><br>If the Cloud Service Provider uses premises or buildings operated by third parties to provide the Cloud Service, the document describes which security requirements the Cloud Service Provider places on these third parties.<br><br>The appropriate and effective verification of implementation is carried out in accordance with the criteria for controlling and monitoring subcontractors (cf. SSO-01, SSO-02). | | |
| **PS-02** The cloud service is provided from two locations that are redundant to each other. The locations meet the security requirements of the Cloud Service Provider (cf. PS-01 Security Concept) and are located in an adequate distance to each other to achieve operational redundancy. Operational redundancy is designed in a way that ensures that the availability requirements specified in the service level agreement are | **BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| met. The functionality of the redundancy is checked at least annually by suitable tests and exercises (cf. BCM-04 - Verification, updating and testing of business continuity). | conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes.<br><br>**DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br><br>Customers are able to determine geographical regions of the data processing and storage, including data backups.<br><br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures. | |
| **PS-03** The structural shell of premises and buildings related to the cloud service provided are physically solid and protected by adequate security measures that meet the security requirements of the Cloud Service Provider (cf. PS-01 Security Concept).<br><br>The security measures are designed to detect and prevent unauthorised access in a timely manner so that it does not compromise the information security of the cloud service. | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| The outer doors, windows and other construction elements reach a level appropriate to the security requirements and withstand a burglary attempt for at least 10 minutes.<br><br>The surrounding wall constructions as well as the locking mechanisms meet the associated requirements. | | |
| **PS-04** At access points to premises and buildings related to the cloud service provided, physical access controls are set up in accordance with the Cloud Service Provider's security requirements (cf. PS-01 Security Concept) to prevent unauthorised access.<br><br>Access controls are supported by an access control system.<br><br>The requirements for the access control system are documented, communicated and provided in a policy or concept in accordance with SP-01 and include the following aspects:<br><br>• Specified procedure for the granting and revoking of access authorisations (cf. IDM-02) based on the principle of least authorisation ("least-privilege-principle") and as necessary for the performance of tasks ("need-to-know-principle"); | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required.<br><br>**PE - 3.** Physical access to the datacenter is reviewed quarterly and verified by the Datacenter Management team.<br><br>**PE - 4.** Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals.<br><br>**PE - 5.** The datacenter facility is monitored 24x7 by security personnel.<br><br>**Note:**<br><br>Revocations of physical access authorizations for unused access are not automatically revoked within 2 months, or withdrawn within 6 months, as specified by C5 criteria PS-04. However, physical access to the datacenters is subject to quarterly user access reviews where access not needed to perform job responsibilities would be removed. Temporary access is also provisioned for a finite period of time before being expired and removed. Thus, ascertained that user access reviews and scheduled expiration / removal of temporary access addresses the risk and are appropriate to meet the C5 objective 6.5. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Automatic revocation of access authorisations if they have not been used for a period of 2 month<br>• Automatic withdrawal of access authorisations if they have not been used for a period of 6 months;<br>• Two-factor authentication for access to areas hosting system components that process cloud customer information;<br>• Visitors and external personnel are tracked individually by the access control during their work in the premises and buildings, identified as such (e.g. by visible wearing of a visitor pass) and supervised during their stay; and<br>• Existence and nature of access logging that enables the Cloud Service Provider, in the sense of an effectiveness audit, to check whether only defined personnel have entered the premises and buildings related to the cloud service provided. | | |
| **PS-05** Premises and buildings related to the cloud service provided are protected from fire and smoke by structural, technical and organisational measures that meet the security requirements of the Cloud Service Provider (cf. PS-01 Security Concept) and include the following aspects:<br>a) Structural Measures: | **PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br>**PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures.<br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| Establishment of fire sections with a fire resistance duration of at least 90 minutes for all structural parts<br><br>b) Technical Measures:<br><br>• Early fire detection with automatic voltage release. The monitored areas are sufficiently fragmented to ensure that the prevention of the spread of incipient fires is proportionate to the maintenance of the availability of the cloud service provided;<br><br>• Extinguishing system or oxygen reduction; and<br><br>• Fire alarm system with reporting to the local fire department.<br><br>c) Organisational Measures:<br><br>• Regular fire protection inspections to check compliance with fire protection requirements; and<br><br>• Regular fire protection exercises. | | |
| **PS-06** Measures to prevent the failure of the technical supply facilities required for the operation of system components with which information from cloud customers is processed, are documented and set up in accordance with the security requirements of the Cloud Service Provider (cf. PS-01 Security Concept) with respect to the following aspects: | **PE - 6.** Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures.<br><br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| a) Operational redundancy (N+1) in power and cooling supply<br><br>b) Use of appropriately sized uninterruptible power supplies (UPS) and emergency power systems (NEA), designed to ensure that all data remains undamaged in the event of a power failure. The functionality of UPS and NEA is checked at least annually by suitable tests and exercises (cf. BCM-04 - Verification, updating and testing of business continuity).<br><br>c) Maintenance (servicing, inspection, repair) of the utilities in accordance with the manufacturer's recommendations.<br><br>d) Protection of power supply and telecommunications lines against interruption, interference, damage and eavesdropping. The protection is checked regularly, but at least every two years, as well as in case of suspected manipulation by qualified personnel regarding the following aspects:<br><br>• Traces of violent attempts to open closed distributors;<br><br>• Up-to-datedness of the documentation in the distribution list;<br><br>• Conformity of the actual wiring and patching with the documentation;<br><br>• The short-circuits and earthing of unneeded cables are intact; and | | |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Impermissible installations and modifications. | | |
| **PS-07** The operating parameters of the technical utilities (cf. PS-06) and the environmental parameters of the premises and buildings related to the cloud service provided are monitored and controlled in accordance with the security requirements of the Cloud Service Provider (cf. PS-01 Security Concept). When the permitted control range is exceeded, the responsible departments of the Cloud-Provider are automatically informed in order to promptly initiate the necessary measures for return to the control range. | **PE - 5.** The datacenter facility is monitored 24x7 by security personnel.<br>**PE - 7.** Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | No exceptions noted. |

### *OPS: Operations*

**Control Objective 6.6:** Ensure proper and regular operation, including appropriate measures for planning and monitoring capacity, protection against malware, logging and monitoring events, and dealing with vulnerabilities, malfunctions and failures.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **OPS-01** The planning of capacities and resources (personnel and IT resources) follows an established procedure in order to avoid possible capacity bottlenecks. The procedures include forecasting future capacity requirements in order to identify usage trends and manage system overload. | **BC - 10.** The network is monitored to ensure availability and address capacity issues in a timely manner.<br>**CCM - 5.** Microsoft Capacity Management team projects future capacity requirements based on internal operational reports, revenue forecasts and inputs from internal component teams. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| Cloud Service Providers take appropriate measures to ensure that they continue to meet the requirements agreed with cloud customers for the provision of the cloud service in the event of capacity bottlenecks or outages regarding personnel and IT resources, in particular those relating to the dedicated use of system components, in accordance with the respective agreements. | | |
| **OPS-02** Technical and organisational safeguards for the monitoring and provisioning and de-provisioning of cloud services are defined. Thus, the Cloud Service Provider ensures that resources are provided and/or services are rendered according to the contractual agreements and that compliance with the service level agreements is ensured. | **BC - 10.** The network is monitored to ensure availability and address capacity issues in a timely manner.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 9.** Service initializes the resource groups within the management portal based on the customer configured templates. Service allows customers to monitor and control the distribution of system resources created within the resource group in order to prevent resources from being congested.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard.<br><br>**PI - 2.** Microsoft Azure management reviews portal performance monthly to evaluate compliance with customer SLA requirements. | No exceptions noted. |
| **OPS-03** Depending on the capabilities of the respective service model, the cloud customer can control and monitor the allocation of the | **LA - 9.** Service initializes the resource groups within the management portal based on the customer configured templates. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| system resources assigned to the customer for administration/use in order to avoid overcrowding of resources and to achieve sufficient performance. | Service allows customers to monitor and control the distribution of system resources created within the resource group in order to prevent resources from being congested. | |
| **OPS-04** Policies and instructions that provide protection against malware are documented, communicated, and provided in accordance with SP-01 with respect to the following aspects:<br>• Use of system-specific protection mechanisms;<br>• Operating protection programs on system components under the responsibility of the Cloud Service Provider that are used to provide the cloud service in the production environment; and<br>• Operation of protection programs for employees' terminal equipment. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br>**IS - 1.** A security policy that defines the information security rules and requirements for the Service environment has been established and communicated. | No exceptions noted. |
| **OPS-05** System components under the Cloud Service Provider's responsibility that are used to deploy the cloud service in the production environment are configured with malware protection according to the policies and instructions. If protection programs are set up with signature and behaviour-based malware detection and removal, these protection programs are updated at least daily. | **VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| **OPS-06** Policies and instructions for data backup and recovery are documented, communicated and provided in accordance with SP-01 regarding the following aspects.<br>• The extent and frequency of data backups and the duration of data retention are consistent with the contractual agreements with the cloud customers and the Cloud Service Provider's operational continuity requirements for Recovery Time Objective (RTO) and Recovery Point Objective (RPO);<br>• Data is backed up in encrypted, state-of-the-art form;<br>• Access to the backed-up data and the execution of restores is performed only by authorised persons; and<br>• Tests of recovery procedures (cf. OPS-08). | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br>**DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br>**DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br>Customers are able to determine geographical regions of the data processing and storage, including data backups.<br>**DS - 8.** Data Protection Services (DPS) backs up data for properties based on a defined schedule and upon request of the properties. Data is retained according to the data type identified by the property. DPS investigates backup errors and skipped files and follows up appropriately.<br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br>**DS - 13.** Production data on backup media is encrypted.<br>**DS - 14.** Azure services are configured to automatically restore customer services upon detection of hardware and system failures.<br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer’s subscription expires, or is terminated.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| **OPS-07** The execution of data backups is monitored by technical and organisational measures. Malfunctions are investigated by qualified staff and rectified promptly to ensure compliance with contractual obligations to cloud customers or the Cloud Service Provider's business requirements regarding the scope and frequency of data backup and the duration of storage. | **DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br><br>**DS - 8.** Data Protection Services (DPS) backs up data for properties based on a defined schedule and upon request of the properties. Data is retained according to the data type identified by the property. DPS investigates backup errors and skipped files and follows up appropriately. | No exceptions noted. |
| **OPS-08** Restore procedures are tested regularly, at least annually. The tests allow an assessment to be made as to whether the contractual agreements as well as the specifications for the maximum tolerable downtime (Recovery Time Objective, RTO) and the maximum permissible data loss (Recovery Point Objective, RPO) are adhered to (cf. BCM-02).<br><br>Deviations from the specifications are reported to the responsible personnel or system components so that these can promptly assess the deviations and initiate the necessary actions. | **DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br><br>**DS - 9.** Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities.<br><br>**BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft’s Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| **OPS-09** The Cloud Service Provider transfers data to be backed up to a remote location or transports these on backup media to a remote location. If the data backup is transmitted to the remote location via a network, the data backup or the transmission of the data takes place in an encrypted form that corresponds to the state-of-the-art. The distance to the main site is chosen after sufficient consideration of the factors recovery times and impact of disasters on both sites. The physical and environmental security measures at the remote site are at the same level as at the main site. | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 5.** Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately.<br><br>**DS - 6.** Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services.<br><br>**DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br><br>Customers are able to determine geographical regions of the data processing and storage, including data backups.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**PE - 1.** Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established.<br><br>**PE - 2.** Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required. | No exceptions noted. |
| **OPS-10** The Cloud Service Provider has established policies and instructions that govern the logging and monitoring of events on system components within its area of responsibility. These policies and instructions are documented, communicated and | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**C5 - 7.** Availability of logging and monitoring software is monitored by internal tools on a continuous basis, and responsible personnel is notified in case of any failure. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| provided according to SP-01 with respect to the following aspects:<br>• Definition of events that could lead to a violation of the protection goals;<br>• Specifications for activating, stopping and pausing the various logs;<br>• Information regarding the purpose and retention period of the logs.<br>• Define roles and responsibilities for setting up and monitoring logging;<br>• Time synchronisation of system components; and<br>• Compliance with legal and regulatory frameworks. | **CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems.<br>**CCM - 4.** Microsoft Azure components are configured to use Coordinated Universal Time (UTC) time and the clocks are synchronized with the domain controller server.<br>**VM - 1.** Azure platform components are configured to log and collect security events.<br>**VM - 2.** Administrator activity in the Azure platform is logged.<br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | |
| **OPS-11** Policies and instructions for the secure handling of metadata (usage data) are documented, communicated and provided according to SP-01 with regard to the following aspects:<br>• Metadata is collected and used solely for billing, incident management and security incident management purposes;<br>• Exclusively anonymous metadata to deploy and enhance the cloud service so that no conclusions can be drawn about the cloud customer or user;<br>• No commercial use; | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br>**C5 - 5.** Customer metadata is collected, retained, and removed based on the documented procedures. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| • Storage for a fixed period reasonably related to the purposes of the collection;<br>• Immediate deletion if the purposes of the collection are fulfilled and further storage is no longer necessary.<br>• Provision to cloud customers according to contractual agreements. | | |
| **OPS-12** The requirements for the logging and monitoring of events and for the secure handling of metadata are implemented by technically supported procedures with regard to the following restrictions:<br>• Access only to authorised users and systems;<br>• Retention for the specified period; and<br>• Deletion when further retention is no longer necessary for the purpose of collection. | **C5 - 5.** Customer metadata is collected, retained, and removed based on the documented procedures.<br>**C5 - 7.** Availability of logging and monitoring software is monitored by internal tools on a continuous basis, and responsible personnel is notified in case of any failure.<br>**CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems.<br>**VM - 1.** Azure platform components are configured to log and collect security events.<br>**VM - 2.** Administrator activity in the Azure platform is logged.<br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | No exceptions noted. |
| **OPS-13** The logging data is automatically monitored for events that may violate the protection goals in accordance with the | **VM - 1.** Azure platform components are configured to log and collect security events. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| logging and monitoring requirements. This also includes the detection of relationships between events (event correlation).<br><br>Identified events are automatically reported to the appropriate departments for prompt evaluation and action. | **VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | |
| **OPS-14** The Cloud Service Provider retains the generated log data and keeps these in an appropriate, unchangeable and aggregated form, regardless of the source of such data, so that a central, authorised evaluation of the data is possible. Log data is deleted if it is no longer required for the purpose for which they were collected.<br><br>Between logging servers and the assets to be logged, authentication takes place to protect the integrity and authenticity of the information transmitted and stored. The transfer takes place using state-of-the-art encryption or a dedicated administration network (out-of-band management). | **C5 - 6.** Logging servers are required to authenticate over encrypted channel to access logs generated within the production environment. Access to logging and monitoring infrastructure is restricted to authorized personnel.<br><br>**CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption. | No exceptions noted. |
| **OPS-15** The log data generated allows an unambiguous identification of user accesses | **CCM - 9.** Microsoft Azure has established forensic procedures to support potential legal action after an information security incident.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| at tenant level to support (forensic) analysis in the event of a security incident.<br><br>Interfaces are available to conduct forensic analyses and perform backups of infrastructure components and their network communication. | | |
| **OPS-16** Access to system components for logging and monitoring in the Cloud Service Provider's area of responsibility is restricted to authorised users. Changes to the configuration are made in accordance with the applicable policies (cf. DEV-03). | **C5 - 6.** Logging servers are required to authenticate over encrypted channel to access logs generated within the production environment. Access to logging and monitoring infrastructure is restricted to authorized personnel.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems. | No exceptions noted. |
| **OPS-17** The Cloud Service Provider monitors the system components for logging and monitoring in its area of responsibility. Failures are automatically and promptly reported to the Cloud Service Provider's responsible departments so that these can assess the failures and take required action. | **C5 - 7.** Availability of logging and monitoring software is monitored by internal tools on a continuous basis, and responsible personnel is notified in case of any failure. | No exceptions noted. |
| **OPS-18** Guidelines and instructions with technical and organisational measures are documented, communicated and provided in accordance with SP-01 to ensure the timely identification and addressing of vulnerabilities in the system components | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the |

| C5 Criteria | Azure Activity | Test Result |
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| used to provide the cloud service. These guidelines and instructions contain specifications regarding the following aspects:<br>• Regular identification of vulnerabilities;<br>• Assessment of the severity of identified vulnerabilities;<br>• Prioritisation and implementation of actions to promptly remediate or mitigate identified vulnerabilities based on severity and according to defined timelines; and<br>• Handling of system components for which no measures are initiated for the timely remediation or mitigation of vulnerabilities. | **VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures. | samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |
| **OPS-19** The Cloud Service Provider has penetration tests carried out by qualified internal personnel or external service providers at least once a year. The penetration tests are carried out according to a documented test methodology and include the system components relevant to the provision of the cloud service in the area of responsibility of the Cloud Service Provider, which have been identified as such in a risk analysis.<br>The Cloud Service Provider assess the severity of the findings made in penetration tests according to defined criteria.<br>For findings with medium or high criticality regarding the confidentiality, integrity or availability of the cloud service, actions must | **VM - 8.** Penetration testing of critical infrastructure components is performed at least annually based on documented Penetration testing procedures and findings are documented, tracked, and remediated. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| be taken within defined time windows for prompt remediation or mitigation. | | |
| **OPS-20** The Cloud Service Provider regularly measures, analyses and assesses the procedures with which vulnerabilities and incidents are handled to verify their continued suitability, appropriateness and effectiveness.<br><br>Results are evaluated at least quarterly by accountable departments at the Cloud Service Provider to initiate continuous improvement actions and to verify their effectiveness. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 6.** The Cyber Defense Operations Center (CDOC) team performs annual tests on the security incident response procedures.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**Note:**<br><br>Azure reviews vulnerability and incident management procedures annually rather than quarterly. Management reviews the implementation of these procedures as part of their internal monitoring and changes can be made as often as needed, supporting continuous improvement of the processes and procedures. Thus, we can conclude that the design of controls is appropriate to meet the C5 Objective 6.6. | No exceptions noted. |
| **OPS-21** The Cloud Service Provider periodically informs the cloud customer on the status of incidents affecting the cloud customer, or, where appropriate and necessary, involve the customer in the resolution, in a manner consistent with the contractual agreements. | **IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**SOC2 - 6.** Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| As soon as an incident has been resolved from the Cloud Service Provider's perspective, the cloud customer is informed according to the contractual agreements, about the actions taken. | **SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner. | |
| **OPS-22** System components in the area of responsibility of the Cloud Service Provider for the provision of the cloud service are automatically checked for known vulnerabilities at least once a month in accordance with the policies for handling vulnerabilities (cf. OPS-18), the severity is assessed in accordance with defined criteria and measures for timely remediation or mitigation are initiated within defined time windows. | **VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures.<br><br>**Note:**<br><br>Azure performs quarterly vulnerability scans on its production environment rather than the monthly scans. Additionally, the production environment is continuously monitored for security and baseline configurations. Thus, we can conclude that the design is appropriate to meet the C5 Objective 6.6. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |
| **OPS-23** System components in the production environment used to provide the cloud service under the Cloud Service Provider's responsibility are hardened according to generally accepted industry standards. The hardening requirements for each system component are documented.<br><br>If non-modifiable ("immutable") images are used, compliance with the hardening | **SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| specifications as defined in the hardening requirements is checked upon creation of the images. Configuration and log files regarding the continuous availability of the images are retained. | | |
| **OPS-24** Cloud customer data stored and processed on shared virtual and physical resources is securely and strictly separated according to a documented approach based on OIS-07 risk analysis to ensure the confidentiality and integrity of this data. | **OA - 18.** Azure network is segregated to separate customer traffic from management traffic.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented. | No exceptions noted. |

### *IDM: Identity and Access Management*

**Control Objective 6.7:** Secure the authorisation and authentication of users of the Cloud Service Provider (typically privileged users) to prevent unauthorised access.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **IDM-01** A role and rights concept based on the business and security requirements of the Cloud Service Provider as well as a policy for managing user accounts and access rights for internal and external employees of the Cloud Service Provider and system components that have a role in automated authorisation processes of the Cloud Service Provider are documented, communicated and made available according to SP-01: | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Assignment of unique usernames;<br>• Granting and modifying user accounts and access rights based on the "least-privilege-principle" and the "need-to-know" principle;<br>• Segregation of duties between operational and monitoring functions ("Segregation of Duties");<br>• Segregation of duties between managing, approving and assigning user accounts and access rights;<br>• Approval by authorised individual(s) or system(s) for granting or modifying user accounts and access rights before data of the cloud customer or system components used to provision the cloud service can be accessed;<br>• Regular review of assigned user accounts and access rights;<br>• Blocking and removing access accounts in the event of inactivity;<br>• Time-based or event-driven removal or adjustment of access rights in the event of changes to job responsibility;<br>• Two-factor or multi-factor authentication for users with privileged access;<br>• Requirements for the approval and documentation of the management of user accounts and access rights. | **OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br>- expiration<br>- length<br>- complexity<br>- history<br>Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity.<br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br>**OA - 21.** Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access.<br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings. | |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **IDM-02** Specified procedures for granting and modifying user accounts and access rights for internal and external employees of the Cloud Service Provider as well as for system components involved in automated authorisation processes of the Cloud Service Provider ensure compliance with the role and rights concept as well as the policy for managing user accounts and access rights. | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity.<br><br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established.<br><br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br><br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br><br>**C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **IDM-03** User accounts of internal and external employees of the Cloud Service Provider as well as for system components involved in automated authorisation processes of the Cloud Service Provider are automatically locked if they have not been used for a period of two months. Approval from authorised personnel or system components are required to unlock these accounts.<br><br>Locked user accounts are automatically revoked after six months. After revocation, the procedure for granting user accounts and access rights (cf. IDM-02) must be repeated. | **OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity. | No exceptions noted. |
| **IDM-04** Access rights are promptly revoked if the job responsibilities of the Cloud Service Provider's internal or external staff or the tasks of system components involved in the Cloud Service Provider's automated authorisation processes change. Privileged access rights are adjusted or revoked within 48 hours after the change taking effect. All other access rights are adjusted or revoked within 14 days. After revocation, the procedure for granting user accounts and access rights (cf. IDM-02) must be repeated. | **OA - 3.** Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**OA - 6.** Production domain-level user accounts are disabled after 90 days of inactivity.<br><br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established. | **Exception Noted:**<br><br>**OA - 3:**<br><br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| | | revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |
| **IDM-05** Access rights of internal and external employees of the Cloud Service Provider as well as of system components that play a role in automated authorisation processes of the Cloud Service Provider are reviewed at least once a year to ensure that they still correspond to the actual area of use. The review is carried out by authorised persons from the Cloud Service Provider's organisational units, who can assess the appropriateness of the assigned access rights based on their knowledge of the task areas of the employees or system components. Identified deviations will be dealt with promptly, but no later than 7 days after their detection, by appropriate modification or withdrawal of the access rights. | **OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**Note:**<br><br>The access revocation based on user access reviews may or may not be completed within 7 days of identification given the time allotted to reviewers to finalize their review of accounts within Azure. Based on the access reviews, access modifications or withdrawals, if any, are performed as needed. Azure user access reviews are performed on a quarterly basis rather than on annual basis as noted in the criteria. Thus, we can conclude that the design of controls is appropriate to meet the C5 objective 6.7. | No exceptions noted. |
| **IDM-06** Privileged access rights for internal and external employees as well as technical users of the Cloud Service Provider are assigned and changed in accordance to the policy for managing user accounts and | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| access rights (cf. IDM-01) or a separate specific policy.<br><br>Privileged access rights are personalised, limited in time according to a risk assessment and assigned as necessary for the execution of tasks ("need-to-know principle"). Technical users are assigned to internal or external employees of the Cloud Service Provider.<br><br>Activities of users with privileged access rights are logged in order to detect any misuse of privileged access in suspicious cases. The logged information is automatically monitored for defined events that may indicate misuse. When such an event is identified, the responsible personnel are automatically informed so that they can promptly assess whether misuse has occurred and take corresponding action. In the event of proven misuse of privileged access rights, disciplinary measures are taken in accordance with HR-04. | **OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**OA - 20.** Alerts are generated when a break-glass account is used to access a production subscription.<br><br>**SOC2 - 11.** Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established. | |
| **IDM-07** The cloud customer is informed by the Cloud Service Provider whenever internal or external employees of the Cloud Service Provider read or write to the cloud customer's data processed, stored or transmitted in the cloud service or have accessed it without the prior consent of the cloud customer. The Information is provided whenever data of the cloud customer is/was not encrypted, the encryption is/was disabled for access or the contractual | **Note:**<br><br>This criteria is not applicable. Azure personnel can obtain temporary access to customer data for support purposes only after obtaining appropriate approval from the customer. Access to customer data without prior customer approval is prohibited. The remaining criteria are addressed by controls that are designed to meet the C5 objective 6.7. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| agreements do not explicitly exclude such information. The information contains the cause, time, duration, type and scope of the access. The information is sufficiently detailed to enable subject matter experts of the cloud customer to assess the risks of the access. The information is provided in accordance with the contractual agreements, or within 72 hours after the access. | | |
| **IDM-08** The allocation of authentication information to access system components used to provide the cloud service to internal and external users of the cloud provider and system components that are involved in automated authorisation processes of the cloud provider is done in an orderly manner that ensures the confidentiality of the information. If passwords are used as authentication information, their confidentiality is ensured by the following procedures, as far as technically possible:<br>• Users can initially create the password themselves or must change an initial password when logging on to the system component for the first time. An initial password loses its validity after a maximum of 14 days.<br>• When creating passwords, compliance with the password specifications (cf. IDM-12) is enforced as far as technically possible.<br>• The user is informed about changing or resetting the password. | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br>- expiration<br>- length<br>- complexity<br>- history | **Exception Noted:**<br>**DS - 1:**<br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • The server-side storage takes place using cryptographically strong hash functions.<br><br>Deviations are evaluated by means of a risk analysis and mitigating measures derived from this are implemented. | Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br><br>**LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**LA - 4.** Customer data that is designated as "confidential" is protected while in storage within Azure services.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**Note:**<br><br>The initial password issued to internal users to access Azure production environment does not expire within 14 days, as specified by C5 criteria IDM-08. However, initial temporary passwords follow the standard Microsoft password policy for age, length and complexity, and users are required to change temporary passwords at first login. Further, once granted access to the production domain, access to production assets is provisioned through security groups. Thus, we can conclude that the design is appropriate to meet the C5 objective 6.7. | |
| **IDM-09** System components in the Cloud Service Provider's area of responsibility that are used to provide the cloud service, authenticate users of the Cloud Service | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
| --- | --- | --- |
| Provider's internal and external employees as well as system components that are involved in the Cloud Service Provider's automated authorisation processes. Access to the production environment requires two-factor or multi-factor authentication. Within the production environment, user authentication takes place through passwords, digitally signed certificates or procedures that achieve at least an equivalent level of security. If digitally signed certificates are used, administration is carried out in accordance with the Guideline for Key Management (cf. CRY-01). The password requirements are derived from a risk assessment and documented, communicated and provided in a password policy according to SP-01. Compliance with the requirements is enforced by the configuration of the system components, as far as technically possible. | Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 8.** Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment.<br><br>**LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br><br>- expiration<br><br>- length<br><br>- complexity<br><br>- history<br><br>Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms.<br><br>**C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been | |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| | established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | |

### *CRY: Cryptography and Key Management*

**Control Objective 6.8:** Ensure appropriate and effective use of cryptography to protect the confidentiality, authenticity or integrity of information.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **CRY-01** Policies and instructions with technical and organisational safeguards for encryption procedures and key management are documented, communicated and provided according to SP-01, in which the following aspects are described:<br>• Usage of strong encryption procedures and secure network protocols that correspond to the state-of-the-art;<br>• Risk-based provisions for the use of encryption which are aligned with the data classification schemes and consider the communication channel, type, strength and quality of the encryption;<br>• Requirements for the secure generation, storage, archiving, retrieval, distribution, withdrawal and deletion of the keys; and<br>• Consideration of relevant legal and regulatory obligations and requirements. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **CRY-02** The Cloud Service Provider has established procedures and technical measures for strong encryption and authentication for the transmission of data of cloud customers over public networks. | **DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**OA - 17.** External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols. | No exceptions noted. |
| **CRY-03** The Cloud Service Provider has established procedures and technical safeguards to encrypt cloud customers' data during storage. The private keys used for encryption are known only to the cloud customer in accordance with applicable legal and regulatory obligations and requirements. Exceptions follow a specified procedure. The procedures for the use of private keys, including any exceptions, must be contractually agreed with the cloud customer. | **DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br><br>**DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**DS - 13.** Production data on backup media is encrypted.<br><br>**LA - 4.** Customer data that is designated as "confidential" is protected while in storage within Azure services.<br><br>**LA - 8.** The private root key belonging to the Azure services is protected from unauthorized access. | **Exception Noted:**<br><br>**DS - 1:**<br><br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **CRY-04** Procedures and technical safeguards for secure key management in the area of responsibility of the Cloud Service Provider include at least the following aspects:<br><br>• Generation of keys for different cryptographic systems and applications;<br><br>• Issuing and obtaining public-key certificates;<br><br>• Provisioning and activation of the keys;<br><br>• Secure storage of keys (separation of key management system from application and middleware level) including description of how authorised users get access;<br><br>• Changing or updating cryptographic keys including policies defining under which conditions and in which manner the changes and/or updates are to be realised;<br><br>• Handling of compromised keys;<br><br>• Withdrawal and deletion of keys; and<br><br>• If pre-shared keys are used, the specific provisions relating to the safe use of this procedure are specified separately. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**DS - 1.** Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis.<br><br>**DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br><br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | **Exception Noted:**<br><br>**DS - 1:**<br><br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |

### *COS: Communication Security*

**Control Objective 6.9:** Ensure the protection of information in networks and the corresponding information processing systems

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **COS-01** Based on the results of a risk analysis carried out according to OIS-06, the Cloud Service Provider has implemented technical safeguards which are suitable to promptly detect and respond to network-based attacks on the basis of irregular incoming or outgoing traffic patterns and/or Distributed Denial- of-Service (DDoS) attacks. Data from corresponding technical protection measures implemented is fed into a comprehensive SIEM (Security Information and Event Management) system, so that (counter) measures regarding correlating events can be initiated. The safeguards are documented, communicated and provided in accordance with SP-01. | **OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**VM - 4.** Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established.<br><br>**VM - 12.** The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard.<br><br>**IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team. | No exceptions noted. |
| **COS-02** Specific security requirements are designed, published and provided for establishing connections within the Cloud Service Provider's network. The security requirements define for the Cloud Service Provider's area of responsibility:<br><br>• in which cases the security zones are to be separated and in which cases cloud customers are to be logically or physically segregated;<br><br>• which communication relationships and which network and application protocols are permitted in each case; | **OA - 18.** Azure network is segregated to separate customer traffic from management traffic.<br><br>**DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**OA - 17.** External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • how the data traffic for administration and monitoring is segregated from each on network level;<br>• which internal, cross-location communication is permitted and;<br>• which cross-network communication is allowed | | |
| **COS-03** A distinction is made between trusted and untrusted networks. Based on a risk assessment, these are separated into different security zones for internal and external network areas (and DMZ, if applicable). Physical and virtualised network environments are designed and configured to restrict and monitor the established connection to trusted or untrusted networks according to the defined security requirements.<br>The entirety of the conception and configuration undertaken to monitor the connections mentioned is assessed in a risk-oriented manner, at least annually, with regard to the resulting security requirements.<br>Identified vulnerabilities and deviations are subject to risk assessment in accordance with the risk management procedure (cf. OIS-06) and follow-up measures are defined and tracked (cf. OPS-18).<br>At specified intervals, the business justification for using all services, protocols, | **VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br>**VM - 9.** Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards.<br>**VM - 13.** Vulnerabilities for network devices are evaluated based on documented procedures and mitigated.<br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established.<br>**OA - 9.** User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary.<br>**OA - 10.** Users are granted access to network devices in the scope boundary upon receiving appropriate approvals.<br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| and ports is reviewed. The review also includes the justifications for compensatory measures for the use of protocols that are considered insecure. | **OA - 18.** Azure network is segregated to separate customer traffic from management traffic.<br><br>**SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | |
| **COS-04** Each network perimeter is controlled by security gateways. The system access authorisation for cross-network access is based on a security assessment based on the requirements of the cloud customers. | **OA - 16.** Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented.<br><br>**OA - 18.** Azure network is segregated to separate customer traffic from management traffic. | No exceptions noted. |
| **COS-05** There are separate networks for the administrative management of the infrastructure and for the operation of management consoles. These networks are logically or physically separated from the cloud customer's network and protected from unauthorised access by multi-factor authentication (cf. IDM-09). Networks used by the Cloud Service Provider to migrate or | **OA - 18.** Azure network is segregated to separate customer traffic from management traffic. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| create virtual machines are also physically or logically separated from other networks | | |
| **COS-06** Data traffic of cloud customers in jointly used network environments is segregated on network level according to a documented concept to ensure the confidentiality and integrity of the data transmitted. | **DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br><br>Keys must have identifiable owners (binding keys to identities) and key management policies.<br><br>**DS - 16.** Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically.<br><br>**LA - 3.** Logical segregation to restrict unauthorized access to other customer tenants is implemented.<br><br>**OA - 18.** Azure network is segregated to separate customer traffic from management traffic. | No exceptions noted. |
| **COS-07** The documentation of the logical structure of the network used to provision or operate the Cloud Service, is traceable and up-to-date, in order to avoid administrative errors during live operation and to ensure timely recovery in the event of malfunctions in accordance with contractual obligations. The documentation shows how the subnets are allocated and how the network is zoned and segmented. In addition, the geographical locations in which the cloud customers' data is stored are indicated. | **C5 - 3.** The architecture of the Azure production network is documented as part of the inventory process. Metadata describing the network attributes (i.e. location, tier, and connections) are dynamically generated and updated as part of standard operations. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **COS-08** Policies and instructions with technical and organisational safeguards in order to protect the transmission of data against unauthorised interception, manipulation, copying, modification, redirection or destruction are documented, communicated and provided according to SP-01. The policy and instructions establish a reference to the classification of information (cf. AM-06). | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | No exceptions noted. |

### *PI: Portability and Interoperability*

**Control Objective 6.10:** Enable the ability to access the cloud service via other cloud services or IT systems of the cloud customers, to obtain the stored data at the end of the contractual relationship and to securely delete it from the Cloud Service Provider.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **PI-01** The cloud service can be accessed by other cloud services or IT systems of cloud customers through documented inbound and outbound interfaces. Further, the interfaces are clearly documented for subject matter experts on how they can be used to retrieve the data.<br><br>Communication takes place through standardised communication protocols that ensure the confidentiality and integrity of the transmitted information according to its protection requirements. Communication | **CCM - 6.** Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Azure Portal.<br><br>**OA - 13.** Access to network devices in the scope boundary is restricted through a limited number of entry points that require authentication over an encrypted connection.<br><br>**OA - 17.** External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols.<br><br>**OA - 19.** Microsoft Azure has published virtualization industry standards supported within its environment.<br><br>**DS - 2.** Customer data communicated through Azure service interfaces is encrypted during transmission over external networks. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| over untrusted networks is encrypted according to CRY-02.<br><br>The type and scope of the documentation on the interfaces is geared to the needs of the cloud customers' subject matter experts in order to enable the use of these interfaces. The information is maintained in such a way that it is applicable for the cloud service's version which is intended for productive use. | Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions.<br><br>**DS - 3.** Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption. | |
| **PI-02** In contractual agreements, the following aspects are defined with regard to the termination of the contractual relationship, insofar as these are applicable to the cloud service:<br><br>• Type, scope and format of the data the Cloud Service Provider provides to the cloud customer;<br><br>• Definition of the timeframe, within which the Cloud Service Provider makes the data available to the cloud customer;<br><br>• Definition of the point in time as of which the Cloud Service Provider makes the data inaccessible to the cloud customer and deletes these; and<br><br>• The cloud customers' responsibilities and obligations to cooperate for the provision of the data.<br><br>The definitions are based on the needs of subject matter experts of potential customers who assess the suitability of the cloud service with regard to a dependency on | **OA - 19.** Microsoft Azure has published virtualization industry standards supported within its environment.<br><br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated.<br><br>**SOC2 - 28.** Customer data is accessible within agreed upon services in data formats compatible with providing those services.<br><br>**C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| the Cloud Service Provider as well as legal and regulatory requirements. | | |
| **PI-03** The Cloud Service Provider's procedures for deleting the cloud customers' data upon termination of the contractual relationship ensure compliance with the contractual agreements (cf. PI-02).<br><br>The deletion includes data in the cloud customer's environment, metadata and data stored in the data backups.<br><br>The deletion procedures prevent recovery by forensic means. | **DS - 10.** Hard disk drive destruction guidelines for the disposal of hard drives have been established.<br><br>**DS - 12.** Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained.<br><br>**DS - 15.** Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated. | No exceptions noted. |

### *DEV: Procurement, Development and Modification of Information Systems*

**Control Objective 6.11:** Ensure information security in the development cycle of information systems.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **DEV-01** Policies and instructions with technical and organisational measures for the secure development of the cloud service are documented, communicated and provided in accordance with SP-01.<br><br>The policies and instructions contain guidelines for the entire life cycle of the cloud service and are based on recognised standards and methods with regard to the following aspects: | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**DS - 4.** Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Security in Software Development (Requirements, Design, Implementation, Testing and Verification);<br>• Security in software deployment (including continuous delivery); and<br>• Security in operation (reaction to identified faults and vulnerabilities). | Keys must have identifiable owners (binding keys to identities) and key management policies.<br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment.<br>**SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments.<br>**SDL - 6.** Source code builds are scanned for malware prior to release to production.<br>**SDL - 7.** The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners.<br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | |
| **DEV-02** In the case of outsourced development of the cloud service (or individual system components), specifications regarding the following aspects are contractually agreed between the Cloud Service Provider and the outsourced development contractor:<br>• Security in software development (requirements, design, implementation, tests | Not Applicable as Microsoft Azure does not outsource development work. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| and verifications) in accordance with recognised standards and methods;<br><br>• Acceptance testing of the quality of the services provided in accordance with the agreed functional and non-functional requirements; and<br><br>• Providing evidence that sufficient verifications have been carried out to rule out the existence of known vulnerabilities. | | |
| **DEV-03** Policies and instructions with technical and organisational safeguards for change management of system components of the cloud service within the scope of software deployment are documented, communicated and provided according to SP-01 with regard to the following aspects:<br><br>• Criteria for risk assessment, categorisation and prioritisation of changes and related requirements for the type and scope of testing to be performed, and necessary approvals for the development/implementation of the change and releases for deployment in the production environment by authorised personnel or system components;<br><br>• Requirements for the performance and documentation of tests;<br><br>• Requirements for segregation of duties during development, testing and release of changes; | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team.<br><br>**CM - 11.** Change management processes include established workflows and procedures to address emergency change requests. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Requirements for the proper information of cloud customers about the type and scope of the change as well as the resulting obligations to cooperate in accordance with the contractual agreements;<br>• Requirements for the documentation of changes in system, operational and user documentation; and<br>• Requirements for the implementation and documentation of emergency changes that must comply with the same level of security as normal changes. | | |
| **DEV-04** The Cloud Service Provider provides a training program for regular, target group-oriented security training and awareness for internal and external employees on standards and methods of secure software development and provision as well as on how to use the tools used for this purpose. The program is regularly reviewed and updated with regard to the applicable policies and instructions, the assigned roles and responsibilities and the tools used. | **IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br>**ELC - 6.** Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct. | No exceptions noted. |
| **DEV-05** In accordance with the applicable policies (cf. DEV-03), changes are subjected to a risk assessment with regard to potential effects on the system components concerned and are categorised and prioritised accordingly. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| | **CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br><br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team. | |
| **DEV-06** Changes to the cloud service are subject to appropriate testing during software development and deployment.<br><br>The type and scope of the tests correspond to the risk assessment. The tests are carried out by appropriately qualified personnel of the Cloud Service Provider or by automated test procedures that comply with the state-of-the-art. Cloud customers are involved into the tests in accordance with the contractual requirements.<br><br>The severity of the errors and vulnerabilities identified in the tests, which are relevant for the deployment decision, is determined according to defined criteria and actions for timely remediation or mitigation are initiated. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br><br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team.<br><br>**CM - 10.** Secure configurations for datacenter software are applied through defined change management procedures including documentation, testing and approval. | No exceptions noted. |
| **DEV-07** System components and tools for source code management and software deployment that are used to make changes to system components of the cloud service in the production environment are subject to a role and rights concept according to IDM-01 and authorisation mechanisms. They must be configured in such a way that all changes are logged and can therefore be traced back | **SDL - 5.** A centralized repository for managing source code changes to the Azure platform is used. Procedures to authorize Azure personnel to submit source code changes based on their role, are established. Code changes submitted to the centralized repository are logged and can be traced to the individuals or system components executing them.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| to the individuals or system components executing them. | **CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel. | |
| **DEV-08** Version control procedures are set up to track dependencies of individual changes and to restore affected system components back to their previous state as a result of errors or identified vulnerabilities. | **CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns. | No exceptions noted. |
| **DEV-09** Authorised personnel or system components of the Cloud Service Provider approve changes to the cloud service based on defined criteria (e.g. test results and required approvals) before these are made available to the cloud customers in the production environment.<br><br>Cloud customers are involved in the release according to contractual requirements. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures.<br><br>**CM - 9.** Datacenter change requests are classified, documented, and approved by the Operations Management Team. | No exceptions noted. |
| **DEV-10** Production environments are physically or logically separated from test or development environments to prevent unauthorised access to cloud customer data, the spread of malware, or changes to system components. Data contained in the production environments is not used in test | **SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments.<br><br>**SDL - 6.** Source code builds are scanned for malware prior to release to production. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
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| or development environments in order not to compromise their confidentiality. | | |

### *SSO: Control and Monitoring of Service Providers and Suppliers*

**Control Objective 6.12:** Ensure the protection of information that service providers or suppliers of the Cloud Service Provider (subcontractors) can access and monitor the agreed services and security requirements.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **SSO-01** Policies and instructions for controlling and monitoring third parties (e.g. service providers or suppliers) whose services contribute to the provision of the cloud service are documented, communicated and provided in accordance with SP-01 with respect to the following aspects:<br>• Requirements for the assessment of risks resulting from the procurement of third-party services;<br>• Requirements for the classification of third parties based on the risk assessment by the Cloud Service Provider and the determination of whether the third party is a subcontractor (cf. Supplementary Information);<br>• Information security requirements for the processing, storage or transmission of information by third parties based on recognised industry standards; | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br>**SOC2- 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established.<br>**IS - 4.** An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established.<br>**SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Information security awareness and training requirements for staff;<br>• applicable legal and regulatory requirements;<br>• Requirements for dealing with vulnerabilities, security incidents and malfunctions;<br>• Specifications for the contractual agreement of these requirements;<br>• Specifications for the monitoring of these requirements; and<br>• Specifications for applying these requirements also to service providers used by the third parties, insofar as the services provided by these service providers also contribute to the provision of the cloud service. | and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br>**SOC2 - 14.** Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed.<br>**ELC - 6.** Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct. | |
| **SSO-02** Service providers and suppliers of the Cloud Service Provider undergo a risk assessment in accordance with the policies and instructions for the control and monitoring of third parties prior to contributing to the delivery of the cloud service. The adequacy of the risk assessment is reviewed regularly, at least annually, by qualified personnel of the Cloud Service Provider during service usage.<br>The risk assessment includes the identification, analysis, evaluation, handling | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br>**C5 - 2.** Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually.<br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| and documentation of risks with regard to the following aspects:<br>• Protection needs regarding the confidentiality, integrity, availability and authenticity of information processed, stored or transmitted by the third party;<br>• Impact of a protection breach on the provision of the cloud service;<br>• The Cloud Service Provider's dependence on the service provider or supplier for the scope, complexity and uniqueness of the service purchased, including the consideration of possible alternatives. | **SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | |
| **SSO-03** The Cloud Service Provider maintains a directory for controlling and monitoring the service providers and suppliers who contribute services to the delivery of the cloud service. The following information is maintained in the directory:<br>• Company name;<br>• Address;<br>• Locations of data processing and storage;<br>• Responsible contact person at the service provider/supplier;<br>• Responsible contact person at the cloud service provider;<br>• Description of the service; | **SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**C5 - 2.** Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually.<br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Classification based on the risk assessment;<br>• Beginning of service usage; and<br>• Proof of compliance with contractually agreed requirements.<br>The information in the list is checked at least annually for completeness, accuracy and validity. | | |
| **SSO-04** The Cloud Service Provider monitors compliance with information security requirements and applicable legal and regulatory requirements in accordance with policies and instructions concerning controlling and monitoring of third-parties.<br>Monitoring includes a regular review of the following evidence to the extent that such evidence is to be provided by third parties in accordance with the contractual agreements:<br>• reports on the quality of the service provided;<br>• certificates of the management systems' compliance with international standards;<br>• independent third-party reports on the suitability and operating effectiveness of their service-related internal control systems; and<br>• Records of the third parties on the handling of vulnerabilities, security incidents and malfunctions. | **SOC2 - 4.** Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis.<br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br>**SOC2 - 25.** Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements.<br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br>**SOC2 - 27.** Microsoft Azure undergoes independent audits and assessments, to monitor and verify compliance with security requirements, at least annually. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| The frequency of the monitoring corresponds to the classification of the third party based on the risk assessment conducted by the Cloud Service Provider (cf. SSO-02). The results of the monitoring are included in the review of the third party's risk assessment.<br><br>Identified violations and deviations are subjected to analysis, evaluation and treatment in accordance with the risk management procedure (cf. OIS-07). | Findings are recorded, reviewed, prioritized, and remediation plans are developed.<br><br>**ELC - 5.** Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment.<br><br>**BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | |
| **SSO-05** The Cloud Service Provider has defined and documented exit strategies for the purchase of services where the risk assessment of the service providers and suppliers regarding the scope, complexity and uniqueness of the purchased service resulted in a very high dependency (cf. Supplementary Information).<br><br>Exit strategies are aligned with operational continuity plans and include the following aspects:<br><br>• Analysis of the potential costs, impacts, resources and timing of the transition of a purchased service to an alternative service provider or supplier;<br><br>• Definition and allocation of roles, responsibilities and sufficient resources to perform the activities for a transition;<br><br>• Definition of success criteria for the transition; | **BC - 6.** Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Definition of indicators for monitoring the performance of services, which should initiate the withdrawal from the service if the results are unacceptable. | | |

### *SIM: Security Incident Management*

**Control Objective 6.13:** Ensure a consistent and comprehensive approach to the capture, assessment, communication and escalation of security incidents.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **SIM-01** Policies and instructions with technical and organisational safeguards are documented, communicated and provided in accordance with SP-01 to ensure a fast, effective and proper response to all known security incidents.<br><br>The Cloud Service Provider defines guidelines for the classification, prioritisation and escalation of security incidents and creates interfaces to the incident management and business continuity management.<br><br>In addition, the Cloud Service Provider has set up a "Computer Emergency Response Team" (CERT), which contributes to the coordinated resolution of occurring security incidents.<br><br>Customers affected by security incidents are informed in a timely and appropriate manner. | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **SIM-02** Subject matter experts of the Cloud Service Provider, together with external security providers where appropriate, classify, prioritise and perform root-cause analyses for events that could constitute a security incident. | **IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted.<br><br>**VM - 8.** Penetration testing of critical infrastructure components is performed at least annually based on documented Penetration testing procedures and findings are documented, tracked, and remediated.<br><br>**PE - 8.** Datacenter physical security management reviews and approves the incident response procedures on a yearly basis. The incident security response procedures detail the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses. | No exceptions noted. |
| **SIM-03** After a security incident has been processed, the solution is documented in accordance with the contractual agreements and the report is sent to the affected customers for final acknowledgement or, if applicable, as confirmation. | **CCM - 9.** Microsoft Azure has established forensic procedures to support potential legal action after an information security incident.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | No exceptions noted. |
| **SIM-04** The Cloud Service Provider informs employees and external business partners of their obligations. If necessary, they agree to or are contractually obliged to report all security events that become known to them and are directly related to the cloud service | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| provided by the Cloud Service Provider to a previously designated central office of the Cloud Service Provider promptly.<br><br>In addition, the Cloud Service Provider communicates that "false reports" of events that do not subsequently turn out to be incidents do not have any negative consequences. | **SOC2 - 13.** Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination.<br><br>**ELC - 6.** Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct. | |
| **SIM-05** Mechanisms are in place to measure and monitor the type and scope of security incidents and to report them to support agencies. The information obtained from the evaluation is used to identify recurrent or significant incidents and to identify the need for further protection. | **IM - 1.** An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated.<br><br>**IM - 2.** Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team.<br><br>**IM - 3.** The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures.<br><br>**IM - 4.** Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | No exceptions noted. |

### *BCM: Business Continuity Management*

**Control Objective 6.14:** Plan, implement, maintain and test procedures and measures for business continuity and emergency management.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **BCM-01** The top management (or a member of the top management) of the Cloud Service Provider is named as the process owner of business continuity and emergency management and is responsible for establishing the process within the company as well as ensuring compliance with the guidelines. They must ensure that sufficient resources are made available for an effective process.<br><br>People in management and other relevant leadership positions demonstrate leadership and commitment to this issue by encouraging employees to actively contribute to the effectiveness of continuity and emergency management. | **BC - 3.** Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events. | No exceptions noted. |
| **BCM-02** Policies and instructions to determine the impact of any malfunction to the cloud service or enterprise are documented, communicated and made available in accordance with SP-01. The following aspects are considered as minimum:<br><br>• Possible scenarios based on a risk analysis;<br><br>• Identification of critical products and services | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br><br>**BC - 3.** Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements.<br><br>**BC - 5.** Risk assessments are conducted to identify and assess business continuity risks related to Azure services.<br><br>**BC - 7.** A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Identify dependencies, including processes (including resources required), applications, business partners and third parties;<br>• Capture threats to critical products and services;<br>• Identification of effects resulting from planned and unplanned malfunctions and changes over time;<br>• Determination of the maximum acceptable duration of malfunctions;<br>• Identification of restoration priorities;<br>• Determination of time targets for the resumption of critical products and services within the maximum acceptable time period (RTO);<br>• Determination of time targets for the maximum reasonable period during which data can be lost and not recovered (RPO); and<br>• Estimation of the resources needed for resumption. | and includes documented procedures for mapping processes to pre-defined enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events. | |
| **BCM-03** Based on the business impact analysis, a single framework for operational continuity and business plan planning will be implemented, documented and enforced to ensure that all plans are consistent. Planning is based on established standards, which are documented in a "Statement of Applicability". | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| Business continuity plans and contingency plans take the following aspects into account:<br>• Defined purpose and scope with consideration of the relevant dependencies;<br>• Accessibility and comprehensibility of the plans for persons who are to act accordingly;<br>• Ownership by at least one designated person responsible for review, updating and approval;<br>• Defined communication channels, roles and responsibilities including notification of the customer;<br>• Recovery procedures, manual interim solutions and reference information (taking into account prioritisation in the recovery of cloud infrastructure components and services and alignment with customers);<br>• Methods for putting the plans into effect;<br>• Continuous process improvement; and<br>• Interfaces to Security Incident Management. | **BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes. | |
| **BCM-04.** The business impact analysis, business continuity plans and contingency plans are reviewed, updated and tested on a regular basis (at least annually) or after significant organisational or environmental changes. Tests involve affected customers (tenants) and relevant third parties. The tests are documented and results are taken | **BC - 1.** Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum.<br>**BC - 4.** The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| into account for future operational continuity measures. | different loss scenario. Each loss scenario is tested at least annually. Issues identified during testing are resolved and plans are updated accordingly.<br><br>**BC - 8.** A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes. | |

### *COM: Compliance*

**Control Objective 6.15:** Avoid non-compliance with legal, regulatory, self-imposed or contractual information security and compliance requirements.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **COM-01** The legal, regulatory, self-imposed and contractual requirements relevant to the information security of the cloud service as well as the Cloud Service Provider's procedures for complying with these requirements are explicitly defined and documented. | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br><br>**SOC2 - 19.** A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements. | No exceptions noted. |
| **COM-02** Policies and instructions for planning and conducting audits are documented, communicated and made available in accordance with SP-01 and address the following aspects: | **SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Restriction to read-only access to system components in accordance with the agreed audit plan and as necessary to perform the activities;<br>• Activities that may result in malfunctions to the cloud service or breaches of contractual requirements are performed during scheduled maintenance windows or outside peak periods; and<br>• Logging and monitoring of activities. | Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br>**SOC2 - 27.** Microsoft Azure undergoes independent audits and assessments, to monitor and verify compliance with security requirements, at least annually. Findings are recorded, reviewed, prioritized, and remediation plans are developed. | |
| **COM-03** Subject matter experts check the compliance of the information security management system at regular intervals, at least annually, with the relevant and applicable legal, regulatory, self-imposed or contractual requirements (cf. COM-01) as well as compliance with the policies and instructions (cf. SP-01) within their scope of responsibility (cf. OIS-01) through internal audits (cf. § 9.3 of ISO/IEC 27001).<br>Identified vulnerabilities and deviations are subject to risk assessment in accordance with the risk management procedure (cf. OIS-06) and follow-up measures are defined and tracked (cf. OPS-18). | **SOC2 - 18.** Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date.<br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed.<br>**SOC2 - 27.** Microsoft Azure undergoes independent audits and assessments, to monitor and verify compliance with security requirements, at least annually. Findings are recorded, reviewed, prioritized, and remediation plans are developed. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **COM-04** The top management of the Cloud Service Provider is regularly informed about the information security performance within the scope of the ISMS in order to ensure its continued suitability, adequacy and effectiveness. The information is included in the management review of the ISMS at is performed at least once a year. | **IS - 3.** Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure.<br><br>**PI - 2.** Microsoft Azure management reviews portal performance monthly to evaluate compliance with customer SLA requirements.<br><br>**SOC2 - 20.** Azure performs periodic Information Security Management System (ISMS) reviews and reviews results with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval.<br><br>**SOC2 - 26.** Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and risks from these threats are formally assessed. | No exceptions noted. |

### *INQ: Dealing with investigation requests from government agencies*

**Control Objective 6.16:** Ensure appropriate handling of government investigation requests for legal review, information to cloud customers, and limitation of access to or disclosure of data.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **INQ-01** Investigation requests from government agencies are subjected to a legal assessment by subject matter experts of the Cloud Service Provider. The assessment determines whether the government agency has an applicable and | **C5 - 4.** Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, notify the impacted customer where permitted by law, where Microsoft is required to produce customer data, work with engineering to collect and produce the minimum data | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| legally valid legal basis and what further steps need to be taken. | responsive to the request as required by law. Procedures are reviewed at least annually. | |
| **INQ-02** The Cloud Service Provider informs the affected Cloud Customer(s) without undue delay, unless the applicable legal basis on which the government agency is based prohibits this or there are clear indications of illegal actions in connection with the use of the Cloud Service. | **C5 - 4.** Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, notify the impacted customer where permitted by law, where Microsoft is required to produce customer data, work with engineering to collect and produce the minimum data responsive to the request as required by law. Procedures are reviewed at least annually. | No exceptions noted. |
| **INQ-03** Access to or disclosure of cloud customer data in connection with government investigation requests is subject to the provision that the Cloud Service Provider's legal assessment has shown that an applicable and valid legal basis exists and that the investigation request must be granted on that basis. | **C5 - 4.** Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, notify the impacted customer where permitted by law, where Microsoft is required to produce customer data, work with engineering to collect and produce the minimum data responsive to the request as required by law. Procedures are reviewed at least annually. | No exceptions noted. |
| **INQ-04** The Cloud Service Provider's procedures for setting up access to or disclosure of cloud customer data as part of an investigation requests, ensure that government agencies only have access to the data they need to investigate.<br>If no clear limitation of the data is possible, the Cloud Service Provider anonymises or pseudonymises the data so that government agencies can only assign it to those cloud customers who are subject of the investigation request. | **C5 - 4.** Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, notify the impacted customer where permitted by law, where Microsoft is required to produce customer data, work with engineering to collect and produce the minimum data responsive to the request as required by law. Procedures are reviewed at least annually. | No exceptions noted. |

### *PSS: Product Safety and Security*

**Control Objective 6.17:** Provide up-to-date information on the secure configuration and known vulnerabilities of the cloud service for cloud customers, appropriate mechanisms for troubleshooting and logging, as well as authentication and authorisation of users of cloud customers.

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **PSS-01** The Cloud Service Provider provides cloud customers with guidelines and recommendations for the secure use of the cloud service provided. The information contained therein is intended to assist the cloud customer in the secure configuration, installation and use of the cloud service, to the extent applicable to the cloud service and the responsibility of the cloud user.<br><br>The type and scope of the information provided will be based on the needs of subject matter experts of the cloud customers who set information security requirements, implement them or verify the implementation (e.g. IT, Compliance, Internal Audit). The information in the guidelines and recommendations for the secure use of the cloud service address the following aspects, where applicable to the cloud service:<br><br>• Instructions for secure configuration;<br><br>• Information sources on known vulnerabilities and update mechanisms;<br><br>• Error handling and logging mechanisms;<br><br>• Authentication mechanisms; | **SOC2 - 7.** Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers.<br><br>**SOC2 - 8.** Azure maintains and distributes an accurate system description to authorized users.<br><br>**SOC2 - 10.** Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service.<br><br>**CCM - 6.** Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Azure Portal. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| • Roles and rights concept including combinations that result in an elevated risk; and<br><br>• Services and functions for administration of the cloud service by privileged users.<br><br>The information is maintained so that it is applicable to the cloud service provided in the version intended for productive use. | | |
| **PSS-02** The Cloud Service Provider applies appropriate measures to check the cloud service for vulnerabilities which might have been integrated into the cloud service during the software development process.<br><br>The procedures for identifying such vulnerabilities are part of the software development process and, depending on a risk assessment, include the following activities:<br><br>• Static Application Security Testing;<br><br>• Dynamic Application Security Testing;<br><br>• Code reviews by the Cloud Service Provider's subject matter experts; and<br><br>• Obtaining information about confirmed vulnerabilities in software libraries provided by third parties and used in their own cloud service.<br><br>The severity of identified vulnerabilities is assessed according to defined criteria and | **CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**SDL - 1.** Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology.<br><br>**SDL - 2.** Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment.<br><br>**SDL - 6.** Source code builds are scanned for malware prior to release to production.<br><br>**SDL - 7.** The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 8.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| measures are taken to immediately eliminate or mitigate them. | **VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | |
| **PSS-03** The Cloud Service Provider operates or refers to a daily updated online register of known vulnerabilities that affect the Cloud Service Provider and assets provided by the Cloud Service Provider that the cloud customers have to install, provide or operate themselves under the customers responsibility.<br><br>The presentation of the vulnerabilities follows the Common Vulnerability Scoring System (CVSS).<br><br>The online register is easily accessible to any cloud customer. The information contained therein forms a suitable basis for risk assessment and possible follow-up measures on the part of cloud users.<br><br>For each vulnerability, it is indicated whether software updates (e.g. patch, update) are available, when they will be rolled out and whether they will be deployed by the Cloud Service Provider, the cloud customer or both of them together. | **VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated.<br><br>**VM - 11.** Microsoft operating system updates for virtual machines are made available through Microsoft Security Response Center (MSRC) site and Windows Update.<br><br>**VM - 13.** Vulnerabilities for network devices are evaluated and mitigated based on documented procedures.<br><br>**SOC2 - 15.** Azure has established baselines for OS deployments.<br><br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **PSS-04** The cloud service provided is equipped with error handling and logging mechanisms. These enable cloud users to obtain security-related information about the security status of the cloud service as well as the data, services or functions it provides.<br><br>The information is detailed enough to allow cloud users to check the following aspects, insofar as they are applicable to the cloud service:<br><br>• Which data, services or functions available to the cloud user within the cloud service, have been accessed by whom and when (Audit Logs);<br><br>• Malfunctions during processing of automatic or manual actions; and<br><br>• Changes to security-relevant configuration parameters, error handling and logging mechanisms, user authentication, action authorisation, cryptography, and communication security.<br><br>The logged information is protected from unauthorised access and modification and can be deleted by the Cloud Customer.<br><br>If the cloud customer is responsible for the activation or type and scope of logging, the Cloud Service Provider must provide appropriate logging capabilities. | **VM - 1.** Azure platform components are configured to log and collect security events.<br><br>**VM - 2.** Administrator activity in the Azure platform is logged.<br><br>**VM - 3.** A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented.<br><br>**VM - 10.** Azure provides logging mechanisms that can be configured by customers to log activities and performance metrics.<br><br>**LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 9.** Service initializes the resource groups within the management portal based on the customer configured templates.<br><br>Service allows customers to monitor and control the distribution of system resources created within the resource group in order to prevent resources from being congested.<br><br>**SOC2 - 9.** Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner.<br><br>**CCM - 3.** Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems.<br><br>**C5 - 5.** Customer metadata is collected, retained, and removed based on the documented procedures.<br><br>**C5 - 6.** Logging servers are required to authenticate over encrypted channel to access logs generated within the production environment. Access to logging and monitoring infrastructure is restricted to authorized personnel. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| | **C5 - 7.** Availability of logging and monitoring software is monitored by internal tools on a continuous basis, and responsible personnel is notified in case of any failure. | |
| **PSS-05** The Cloud Service Provider provides authentication mechanisms that can force strong authentication (e.g. two or more factors) for users, IT components or applications within the cloud users' area of responsibility.<br><br>These authentication mechanisms are set up at all access points that allow users, IT components or applications to interact with the cloud service.<br><br>For privileged users, IT components or applications, these authentication mechanisms are enforced. | **LA - 1.** External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings.<br><br>**LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br><br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks.<br><br>**OA - 4.** User credentials adhere to established corporate standards and group policies for password requirements:<br><br>- expiration<br>- length<br>- complexity<br>- history<br><br>Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced.<br><br>**OA - 14.** Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| **PSS-06** To protect confidentiality, availability, integrity and authenticity during interactions with the cloud service, a suitable session management system is used that at least corresponds to the state-of-the-art and is protected against known attacks. Mechanisms are implemented that invalidate a session after it has been detected as inactive. The inactivity can be detected by time measurement. In this case, the time interval can be configured by the Cloud Service Provider or - if technically possible - by the cloud customer. | **LA - 5.** User sessions within Azure can be configured by customers to expire after a stipulated period of inactivity. | No exceptions noted. |
| **PSS-07** If passwords are used as authentication information for the cloud service, their confidentiality is ensured by the following procedures:<br>• Users can initially create the password themselves or must change an initial password when logging in to the cloud service for the first time. An initial password loses its validity after a maximum of 14 days.<br>• When creating passwords, compliance with the length and complexity requirements of the Cloud Service Provider (cf. IDM-09) or the cloud customer is technically enforced.<br>• The user is informed about changing or resetting the password.<br>• The server-side storage takes place using state-of-the-art cryptographically strong | **LA - 2.** Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time.<br>**LA - 11.** One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| hash functions in combination with at least 32-bit long salt values. | | |
| **PSS-08** The Cloud Service Provider provides cloud users with a roles and rights concept for managing access rights. It describes rights profiles for the functions provided by the cloud service.<br><br>The rights profiles are suitable for enabling cloud users to manage access authorisations and permissions in accordance with the principle of least-privilege and how it is necessary for the performance of tasks ("need-to-know principle") and to implement the principle of functional separation between operational and controlling functions ("separation of duties"). | **C5 - 1.** Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management.<br><br>**OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 5.** Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews.<br><br>**SDL - 3.** Responsibilities for submitting and approving production deployments are segregated within the Azure teams.<br><br>**CM - 3.** Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel. | No exceptions noted. |
| **PSS-09** Access to the functions provided by the cloud service is restricted by access controls (authorisation mechanisms) that verify whether users, IT components, or applications are authorised to perform certain actions.<br><br>The Cloud Service Provider validates the functionality of the authorisation mechanisms before new functions are made available to cloud users and in the event of changes to the authorisation mechanisms of existing functions (cf. DEV-06). The severity of identified vulnerabilities is assessed | **OA - 1.** Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities.<br><br>**OA - 2.** Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources.<br><br>**OA - 7.** Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident handling purposes, have been established. | **Exception Noted:**<br><br>**VM - 5:**<br><br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| according to defined criteria based on industry standard metrics (e.g. Common Vulnerability Scoring System) and measures for timely resolution or mitigation are initiated. Vulnerabilities that have not been fixed are listed in the online register of known vulnerabilities (cf. PSS-02). | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 2.** Key stakeholders approve changes prior to release into production based on documented change management procedures.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**SDL - 4.** New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments.<br><br>**VM - 5.** Procedures to evaluate and implement Microsoft-released patches to Service components have been established.<br><br>**VM - 6.** Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated. | In addition, two server-patch samples were missing during the examination period. |
| **PSS-10** If the Cloud Service offers functions for software-defined networking (SDN), the confidentiality of the data of the cloud user is ensured by suitable SDN procedures.<br><br>The Cloud Service Provider validates the functionality of the SDN functions before providing new SDN features to cloud users or modifying existing SDN features. Identified defects are assessed and corrected in a risk-oriented manner. | **CM - 1.** Procedures for managing different types of changes to the Azure platform have been documented and communicated.<br><br>**CM - 4.** Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation.<br><br>**CM - 5.** Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns.<br><br>**CM - 6.** Procedures to manage changes to network devices in the scope boundary have been established.<br><br>**CM - 7.** Secure network configurations are applied and reviewed through defined change management procedures. | No exceptions noted. |
| **PSS-11** If cloud customers operate virtual machines or containers with the cloud | **SOC2 - 15.** Azure has established baselines for OS deployments. | No exceptions noted. |

| C5 Criteria | Azure Activity | Test Result |
|---|---|---|
| service, the Cloud Service Provider must ensure the following aspects:<br>• The cloud customer can restrict the selection of images of virtual machines or containers according to his specifications, so that users of this cloud customer can only launch the images or containers released according to these restrictions.<br>• If the Cloud Service Provider provides images of virtual machines or containers to the Cloud Customer, the Cloud Service Provider appropriately inform the Cloud Customer of the changes made to the previous version.<br>• In addition, these images provided by the Cloud Service Provider are hardened according to generally accepted industry standards. | Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually.<br>**LA - 12.** Images may be customized and access to images may be restricted by the customer. Updates to available images are communicated to through customer-facing websites.<br>**OA - 19.** Microsoft Azure has published virtualization industry standards supported within its environment.<br>**Note:**<br>Hardened images available through the Azure Marketplace are published by third-party vendors. Microsoft expects customers to hardened / customize images as per customer requirements. Thus, we can conclude that the design is appropriate to meet the C5 objective 6.17. | |
| **PSS-12** The cloud customer is able to specify the locations (location/country) of the data processing and storage including data backups according to the contractually available options.<br>This must be ensured by the cloud architecture. | **DS - 7.** Customer data is automatically replicated within Azure to minimize isolated faults.<br>Customers are able to determine geographical regions of the data processing and storage, including data backups. | No exceptions noted. |

**Part D: Contains the details of the test procedures performed to test the operating effectiveness of the control activities and the results of the testing**

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| IS - 1 | A security policy that defines the information security rules and requirements for the Service environment has been established and communicated. | • Inquired of management if a documented security policy that specifies the documented rules and requirements applicable to the Microsoft Azure environment exists.<br>• Obtained and inspected Microsoft Azure's Information Security Policy and ascertained that it addressed applicable information security requirements.<br>• Observed that the Security Policy document was published and communicated to Microsoft Azure employees and the relevant third parties.<br>• Inspected the Security Policy to determine if the security objectives were derived from the corporate objectives and business processes, relevant laws and regulations as well as the current and future expected threat environment with respect to information security. | No exceptions noted. |
| IS - 2 | The Security Policy is reviewed and approved annually by appropriate management. | • Inquired of management to gain an understanding of the process for reviewing and approving the Microsoft Azure security policy.<br>• Obtained and inspected the latest policy review performed for the Microsoft Azure security policy and approval provided by management. | No exceptions noted. |
| IS - 3 | Management has established defined roles and responsibilities to oversee implementation of the Security Policy across Azure. | • Inquired of management to gain an understanding of the implementation of security policy requirements within Microsoft Azure through the designation of roles and responsibilities.<br>• Inspected relevant documentation (e.g., SOPs) to test if roles and responsibilities for implementation of the security policy requirements were defined and documented. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| IS - 4 | An information security education and awareness program that includes policy training and periodic security updates for Azure personnel has been established. | • Inquired of management to gain an understanding of the processes for awareness and training on information security for employees, contractors, and third-party users.<br>• Inspected training material to ascertain that it incorporated security policy requirements, and was updated as needed. | No exceptions noted. |
| OA - 1 | Administrative access to the Service environment is controlled through defined interfaces that require authentication using appropriate credentials. Privileges (i.e., read, write) are restricted to authorized personnel through designated channels based on job responsibilities. | • Inquired of management to understand the procedures in place for accessing the Azure production environment, including data backups and datacenters.<br>• For a sample of Azure services, obtained and inspected authentication mechanisms and associated security groups to ascertain that privileged access to the Azure Management Portal and other administrative tools required authentication and was restricted to authorized entities based on job responsibilities.<br>• Obtained and inspected a list of users with privileged access and ascertained that user access to the relevant domains was restricted to defined security user groups and membership.<br>• Obtained and inspected the current listing of user accounts, including their respective user IDs within the Azure domains, and ascertained that each user was assigned a unique user ID which clearly identifies the user. | No exceptions noted. |
| OA - 2 | Requests for new access, or modifications to existing access, are submitted and approved prior to provisioning employee, contractor, and service provider access to specific applications or information resources. | • Inquired of management if access requests require approval by the security group owner or asset owner using the account management tool.<br>• For a sample security group, observed the approval rules configuration and enforcement of approval rules for an access request.<br>• For a sample of security groups / individual user access, obtained and inspected approvals prior to provisioning access to specific applications or information resources. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| OA - 3 | Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place. | • Inquired of the Operations team if procedures for disabling terminated user accounts within a defined time period after the user's termination date are established.<br>• Inspected a comparison of the list of users from the relevant production domains against the HR termination report. Matches from the domain users to the terminated users were checked in the Microsoft Global Address List, HR application, account creation date, and / or access request tickets to ascertain if access was still appropriate.<br>• Selected a sample of terminated users and obtained Active Directory (AD) domain logs showing that corporate accounts and AD production domain accounts were disabled within five days of the user's termination date. | **Exception Noted:**<br>A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no additional exceptions were noted. |
| OA - 4 | User credentials adhere to established corporate standards and group policies for password requirements:<br>- expiration<br>- length<br>- complexity<br>- history | • Inquired of management to gain an understanding of the implementation of password standards (e.g., length, complexity, age) and acceptable use guidelines for user credentials created on production domains where passwords are in use.<br>• Obtained and inspected the group policies enforced on the corporate domain and production domains where passwords are in use. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | Initial passwords have secure mechanisms in place for distribution and first-time use. For production domains where passwords are not in use, multi-factor authentication is enforced. | • For production domains where passwords are not in use, observed use of multi-factor authentication with a security PIN and certificate.<br>• Inquired if temporary passwords were required to be changed on first use and expire on a timely basis.<br>• Obtained sample notifications for the production domains and observed the security mechanisms in place for password distribution and first-time use. | |
| OA - 5 | Access privileges are reviewed quarterly to determine if access rights are commensurate to the user's job duties. Access is modified based on the results of the reviews. | • Inquired of management to gain an understanding of the process for performing periodic user access reviews for Microsoft Azure.<br>• For a sample of managers reviewing Azure access, obtained and inspected the review log to ascertain whether reviews were performed for the managers' direct reports, and completed with implementation of identified changes. | No exceptions noted. |
| OA - 6 | Production domain-level user accounts are disabled after 90 days of inactivity. | • Inquired of the Cloud and Enterprise Security team if procedures for disabling user accounts that have been inactive for 90 days in the production environment are established.<br>• Obtained and inspected the configuration settings for applicable domains, to ascertain whether accounts are disabled after 90 days of inactivity.<br>• Obtained and inspected applicable domain user listings, including last login date and account status, to ascertain that there were no accounts that had been inactive for over 90 days. | No exceptions noted. |
| OA - 7 | Procedures for granting Azure personnel temporary access to customer data and applications, upon appropriate approval for customer support or incident | • Inquired of management to understand the procedures in place for granting and revoking temporary access to internal administration services.<br>• For a sample of services, obtained and inspected temporary access logs and associated tickets to ascertain that temporary | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | handling purposes, have been established. | access was granted and approved per the defined process and had documented business justification associated with it. | |
| OA - 8 | Authentication over an encrypted Remote Desktop Connection is used for administrator access to the production environment. | • Inquired of the process owners to understand the authentication enforced during an RDP session to production environment and encryption of an RDP session.<br>• Observed the authentication mechanisms and corresponding encrypted channel to ascertain that login attempt to remotely connect to the production environment was authenticated and over an encrypted connection. | No exceptions noted. |
| OA - 9 | User groups and Access Control Lists have been established to restrict access to network devices in the scope boundary. | • Inquired of the Networking team if user groups and Access Control Lists (ACLs) are established to restrict access to network devices.<br>• Inquired if user groups were created and enforced via the Active Directory.<br>• Obtained and inspected configuration for a sample of network devices, and ascertained that TACACS+ / RADIUS was used for authentication and authorization of access, and that ACLs were applied. | No exceptions noted. |
| OA - 10 | Users are granted access to network devices in the scope boundary upon receiving appropriate approvals. | • Inquired of the Networking team regarding the procedures in place to grant access to new users for network devices in the scope boundary.<br>• Observed the approval process to ascertain that access to a security group was granted upon approval from the network security group owner.<br>• For a sample of network security groups, sampled a user and ascertained that access was appropriate. | No exceptions noted. |
| OA - 13 | Access to network devices in the scope boundary is restricted through a limited number of entry | • Inquired of the Networking team if access to the network devices is restricted through a limited number of entry points | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | points that require authentication over an encrypted connection. | which require authentication over an encrypted Remote Desktop connection.<br>• Inspected the Network Account Management SOP and ascertained that procedures to restrict user access to network devices in the scope boundary, through a limited number of entry points that required authentication over an encrypted connection were established.<br>• For a sampled hop-box server, through observation, ascertained that remote access to network devices involved logging into a hop-box server using domain credentials and a smart card followed by a log in to the internal-facing terminal server using domain credentials. Also, noted that Secure Shell (SSH) was enforced to access the network device.<br>• Obtained and inspected IP addresses associated with a sample of hop-box servers and ascertained that the IP addresses allocated were restricted to a specific subnet for each instance of Azure cloud.<br>• Obtained and inspected configuration for a sample of network devices and ascertained that device access was restricted via above terminal servers. | |
| OA - 14 | Access to network devices in the scope boundary requires two-factor authentication and / or other secure mechanisms. | • Inquired of the Networking team if two-factor authentication is enforced for connecting to a network device.<br>• For a sample network device, observed that logging in to the network device required two-factor authentication.<br>• Obtained and inspected configuration for a sample of network devices, and ascertained that authentication was enforced via TACACS+ or RADIUS servers. | No exceptions noted. |
| OA - 15 | Passwords used to access Azure network devices are restricted to authorized individuals based on job | • Inquired of the Networking Team to gain an understanding of how passwords used to access network devices are restricted and rotated. | **Exception Noted:**<br>For eight of 25 sampled network devices, evidence related to password rotation |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | responsibilities and changed on a periodic basis. | • Obtained and inspected tickets / rotation logs for sampled network devices to ascertain that the passwords for network devices were rotated as per the defined cadence.<br>• Observed that passwords were stored in secret repositories with access restricted to authorized individuals based on job responsibilities. | was not retained and not available for inspection to corroborate that the passwords were changed on a periodic basis. |
| OA - 16 | Network filtering to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components is implemented. | • Inquired of management regarding the packet filtering mechanisms implemented to restrict incoming and outgoing traffic.<br>• Obtained and inspected the configuration files for sampled nodes and ascertained that filtering mechanisms and rules were configured to prevent spoofed traffic and restrict incoming and outgoing traffic to trusted service components. | No exceptions noted. |
| OA - 17 | External traffic to the customer VM(s) is restricted to customer-enabled ports and protocols. | • Inquired of management regarding network access controls in place to restrict external traffic to ports and protocols defined and enabled by customers.<br>• Attempted to access a sample set of VMs and observed that access was restricted based on the external traffic rules for ports and protocols enabled within the service configuration. | No exceptions noted. |
| OA - 18 | Azure network is segregated to separate customer traffic from management traffic. | • Inquired of management regarding the procedures and technical controls used for segregating networks within the Azure environment.<br>• Obtained and inspected mechanisms used for segregating and restricting network traffic within the Azure environment. | No exceptions noted. |
| OA - 19 | Microsoft Azure has published virtualization industry standards supported within its environment. | • Inquired of the Azure Operations team to understand the various published virtualization industry standards supported within the Azure environment, and solution-specific virtualization hooks available for customer review. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | | • Reperformed the control to ascertain that Azure published virtualization formats (e.g., Open Virtualization Format (OVF)) supported interoperability with third-party products such as Oracle Virtual Box, VMware Workstation, and XenSource. | |
| OA - 20 | Alerts are generated when a break-glass account is used to access a production subscription. | • Inquired of management to understand the procedures in place for monitoring break-glass account access to the production environment.<br>• Obtained and inspected the configuration files to ascertain that automated mechanisms were in place to generate alerts when a break-glass account is used to access the production environment. | No exceptions noted. |
| OA - 21 | Access to production resources requires the use of a Secure Admin Workstation (SAW) which requires MFA for access. | • Inquired of management to understand the process of using Secure Admin Workstation (SAW) machine and authentication using MFA for accessing production resources.<br>• Observed the access and authentication mechanisms to ascertain that access to production resources required using Secure Admin Workstation (SAW) machine and MFA for authentication. | No exceptions noted. |
| DS - 1 | Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis. | • Inquired of the Azure Operations team to understand the different types of cryptographic certificates and keys used by the services to connect to internal components, and their cadence / frequency of rotation.<br>• Observed the security of the cryptographic certificates and keys, and the process for periodic rotation. Additionally, ascertained through inspection of security group membership that the security groups granting access to the secrets were restricted to those personnel having valid business justification for access.<br>• For a sample of services, obtained and inspected evidence (e.g., tickets, logs) indicating if the secrets were rotated based on the pre-determined frequency. | **Exception Noted:**<br>One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | | • Performed inquiry and ascertained that the master key was secured based on controlled procedures. | |
| DS - 2 | Customer data communicated through Azure service interfaces is encrypted during transmission over external networks.<br>Location-aware technologies are implemented within the Azure portal to identify and validate authentication sessions. | • Inquired of the Azure Operations team to understand the controls in place that restrict transmission of customer data to secure protocols through various endpoints over external networks, and location-aware technologies which are implemented within the Azure Portal.<br>• Reperformed the control to ascertain that restrictions were in place to prevent use of insecure protocols (e.g., HTTP) for transmission of customer data over external networks, and location-aware technologies were implemented within the Azure Portal to identify and validate authentication sessions. | No exceptions noted. |
| DS - 3 | Internal communication between key Azure components where customer data is transmitted / involved is secured using encryption. | • Inquired of the Azure Operations team to understand the use of secure mechanisms such as encryption for communication between internal Azure components that involves customer data.<br>• For a sample of Azure platform components, inspected configurations and observed the use of secure encryption mechanisms for internal communication. | No exceptions noted. |
| DS - 4 | Cryptographic controls are used for information protection within the Azure platform based on the Azure Cryptographic Policy and Key Management procedures.<br>Keys must have identifiable owners (binding keys to identities) and key management policies. | • Inquired of management regarding the policies and procedures in place for using cryptographic controls within the Azure environment.<br>• For a sample of major releases, ascertained that cryptographic policy requirements were enforced and required approvals were obtained for exceptions.<br>• For a sample of secrets from different Azure services, obtained and inspected secret configuration to ascertain that secrets were stored under service specific vaults or configuration files. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| DS - 5 | Backups of key Azure service components and secrets are performed regularly and stored in fault-tolerant (isolated) facilities. Backups are monitored and backup errors are investigated and followed-up on appropriately. | • Inquired of management if backups of key Azure service components and secrets are performed regularly and stored in fault tolerant facilities.<br>• Obtained and inspected configurations and logs to ascertain that platform data and secrets data were replicated, backed up, and stored in separate locations.<br>• Obtained and inspected sample IcM tickets generated to ascertain that backup errors were investigated and remediated appropriately. | No exceptions noted. |
| DS - 6 | Critical Azure components have been designed with redundancy to sustain isolated faults and minimize disruptions to customer services. | • Inquired about the redundancy mechanisms in place for key components within the production environment.<br>• For a sample of platform components, inspected configurations and ascertained that redundancies were implemented within the production environment. | No exceptions noted. |
| DS - 7 | Customer data is automatically replicated within Azure to minimize isolated faults.<br>Customers are able to determine geographical regions of the data processing and storage, including data backups. | • Inquired about the redundancy mechanisms in place to replicate data stored across Azure services.<br>• For a sample of Storage accounts and SQL Databases, inspected configurations and ascertained that data was replicated across multiple nodes.<br>• Obtained and inspected configurations for the sampled services to determine geographical region of the data processing and storage. | No exceptions noted. |
| DS - 8 | Data Protection Services (DPS) backs up data for properties based on a defined schedule and upon request of the properties. Data is retained according to the data type identified by the property. DPS investigates backup errors and | • Inquired of the DPS team regarding the process for scheduling of backups of production database based on customer requests.<br>• Inquired if backup of customer data was performed based on a defined schedule in accordance with documented operating procedures. Additionally, inspected the procedures to ascertain that retention of backup data was consistent with the security categorization assigned to it. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | skipped files and follows up appropriately. | • For a sample of backup scheduling requests, obtained and inspected backup logs and ascertained that they were completed in accordance with customer requests and documented operating procedures. For a sample of backup failures, obtained tickets / backup status showing resolution details. | |
| DS - 9 | Backup restoration procedures are defined and backup data integrity checks are performed through standard restoration activities. | • Inquired of the DPS team if backup data integrity checks are conducted as part of standard restoration activities.<br>• Obtained and inspected DPS operating procedures and ascertained that processes for completing restoration from backups were defined. Additionally, ascertained that a ticketing system was used for tracking restoration requests.<br>• For a sample of restoration requests, obtained and inspected restoration tickets to ascertain that backup data integrity checks were completed in accordance with the request and documented operating procedures. | No exceptions noted. |
| DS - 10 | Hard disk drive destruction guidelines for the disposal of hard drives have been established. | • Inquired of management to understand the process for hard disk drive disposal.<br>• Obtained the population of hard disk drive disposals performed during the examination period, and judgmentally selected a sample of disposals.<br>• For a sample of disposals, obtained and inspected tickets to ascertain that the disposal followed the standard disposal process. | No exceptions noted. |
| DS - 11 | Data corresponding to Azure is backed up to another region other than the primary data location and retained as per the retention policy. | • Inquired of the DPS team if processes for backups and retention to primary and secondary locations are established.<br>• Obtained and inspected population of storage accounts and ascertained that the process for backups and retention was documented. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | | • For a sample of storage policies, obtained and inspected backup and retention policy configurations, to ascertain that data is backed up and retained as per the retention policy. | |
| DS - 12 | Offsite backup tape destruction guidelines have been established and destruction certificates for expired backup tapes are retained. | • Inquired of the DPS team if offsite backup tape destruction guidelines are established and destruction certificates for expired backup tapes are retained.<br>• Obtained and inspected DPS SOPs and guidelines and ascertained that the process for destruction of backup tapes was documented.<br>• For a sample of media destruction requests, obtained and inspected media destruction evidence (i.e., request containing the list of expired tapes and corresponding destruction certificates) to ascertain that the destruction evidence was retained. | No exceptions noted. |
| DS - 13 | Production data on backup media is encrypted. | • Inquired of the DPS team if production data is encrypted prior to storage on backup media.<br>• For a sample of servers, obtained and inspected data encryption configurations to ascertain that production data was encrypted.<br>• Obtained and inspected the configuration settings for a sample of backup encryption system instances to ascertain whether they are enabled to encrypt production data for tape backups. | No exceptions noted. |
| DS - 14 | Azure services are configured to automatically restore customer services upon detection of hardware and system failures. | • Inquired about the failover mechanisms in place to automatically restore role instances upon detection of a hardware and system failure.<br>• For a sample of node instances, observed the health status and service healing history to ascertain that automatic restoration was occurring. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| DS - 15 | Customer data is retained and removed per the defined terms within the Microsoft Online Services Terms (OST), when a customer's subscription expires, or is terminated. | • Inquired about the policy and procedures in place for the removal / retention of customer data upon termination of subscription.<br>• Obtained and inspected customer documentation to ascertain that data removal / retention processes were addressed.<br>• For a subscription, ascertained that access to customer data was handled in accordance with Microsoft Online Services Terms upon termination of the subscription. | No exceptions noted. |
| DS - 16 | Each Online Service's customer's data is segregated from other Online Services' customers' data, either logically or physically. | • Performed inquiry of the service owner to understand how the AAD Distributed Directory Services environment enforces logical or physical segregation of customer data.<br>• Reperformed the control using test domains to ascertain that customer (tenant) data was segregated. | No exceptions noted. |
| CM - 1 | Procedures for managing different types of changes to the Azure platform have been documented and communicated. | • Inquired of management regarding the procedures for managing various types of changes to the Microsoft Azure environment including tracking, approval, and testing requirements.<br>• Obtained documentation of Change Management procedures. Inspected documentation and ascertained that procedures for requesting, classifying, approving and implementing all types of changes, including major release, minor release, hotfix, and configuration changes, were defined. | No exceptions noted. |
| CM - 2 | Key stakeholders approve changes prior to release into production based on documented change management procedures. | • Inquired of management about the procedures for managing various types of changes to the Microsoft Azure environment, including approval requirements.<br>• Identified and obtained the population of production deployments made during the examination period from the ticketing system, for the Microsoft Azure platform.<br>• Selected a sample of changes to production and ascertained that documented procedures for approval (including if the result of the risk assessment is documented appropriately and | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | | comprehensively and all changes were prioritized on the basis of the risk assessment) were followed prior to deployment. | |
| CM - 3 | Responsibilities for requesting, approving, and implementing changes to the Azure platform are segregated among designated personnel. | • Inquired of management if segregation of duties for key responsibilities for requesting, approving, and implementing changes to the Azure platform, is implemented.<br>• Identified and obtained the population of production deployments made during the examination period from the ticketing system, for the Microsoft Azure platform.<br>• Selected a sample of changes to production and ascertained that key responsibilities were segregated. | No exceptions noted. |
| CM - 4 | Software releases and configuration changes to the Azure platform are tested based on established criteria prior to production implementation. | • Inquired of management about the procedures for managing various types of changes to the Microsoft Azure environment, including testing requirements.<br>• Identified and obtained the population of the production deployments made during the examination period from the ticketing system, for the Microsoft Azure platform.<br>• Selected a sample of changes to production and ascertained that documented procedures for testing were followed prior to deployment. | No exceptions noted. |
| CM - 5 | Implemented changes to the Azure platform are reviewed for adherence to established procedures prior to closure. Changes are rolled back to their previous state in case of errors or security concerns. | • Inquired of management regarding the procedures for reviewing implemented changes for adherence to established procedures prior to closure.<br>• Identified and obtained the population of production deployments made during the examination period from the ticketing system, for the Microsoft Azure platform.<br>• Selected a sample of changes to production and ascertained that roll back procedures were in place to roll back changes to their previous state in case of errors or security concerns.<br>• Selected a sample of changes to production and ascertained that changes were reviewed prior to closure. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| CM - 6 | Procedures to manage changes to network devices in the scope boundary have been established. | • Inquired of the Networking team regarding the procedures established for managing changes to network devices in the scope boundary.<br>• Inspected network change management procedures, and for a sample of changes, obtained and inspected change management tickets to ascertain that documented procedures for managing changes to network devices including documentation, classification, review, testing and approval, were followed prior to deployment. | No exceptions noted. |
| CM - 7 | Secure network configurations are applied and reviewed through defined change management procedures. | • Inquired of the Networking team if the implementation and review of secure network configuration standards are followed through defined change management procedures.<br>• Inspected Azure Networking change procedures and tested if change management procedures for secure network configuration changes were established.<br>• Obtained and inspected a sample of network change requests and ascertained that changes were documented, tested, reviewed, and approved based on the change type. | No exceptions noted. |
| CM - 8 | The Technical Security Services team develops security configuration standards for systems in the physical environment that are consistent with industry-accepted hardening standards. These configurations are documented in system baselines, are reviewed annually, and relevant configuration changes are communicated to impacted teams. | • Inquired of the Cloud + AI Security team if security configuration standards for systems in the datacenters' environment are based on industry-accepted hardening standards and configurations are documented in system baselines and are reviewed annually. Relevant configuration changes are communicated to impacted teams.<br>• Inspected security configuration standards and technical baseline published in a central location and approvals related to an annual review and ascertained that technical baselines were consistent with the industry standard, approved, and the results were communicated to impacted teams.<br>• Selected a sample of servers and inspected their configuration to ascertain that documented security configuration standards and technical baseline were implemented. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| CM - 9 | Datacenter change requests are classified, documented, and approved by the Operations Management Team. | • Inquired of the Operations Management team if change requests are classified, documented, and approved by the Operations Management Team.<br>• Inspected procedures and tested if established procedures cover the process for requesting, documenting (including if the changes were assessed for risk and prioritized), classifying, approving, and executing datacenter changes.<br>• Selected a sample of change requests and tested that changes were classified, approved, and executed in accordance with documented procedures. | No exceptions noted. |
| CM - 10 | Secure configurations for datacenter software are applied through defined change management procedures including documentation, testing and approval. | • Inquired of the Server Standards Team if server-based images are documented, tested and approved. Additionally, inquired if release to production is restricted to appropriate personnel.<br>• Obtained and inspected user access to the release production server and ascertained that access was restricted to appropriate personnel.<br>• Selected a sample of bugs and requirements from the releases during the period and inspected change tickets to ascertain that secure configurations for datacenter software were applied through defined change management procedures. | No exceptions noted. |
| CM - 11 | Change management processes include established workflows and procedures to address emergency change requests. | • Inquired of the Networking team if procedures and workflows are established to address emergency change requests.<br>• Inspected the Emergency Change Management Procedures and tested that procedures and workflows were established to address emergency change requests. | No exceptions noted. |
| CM - 12 | Azure has implemented tools to perform integrity verification checks to detect unauthorized changes to software, firmware and information. | • Inquired of management regarding the tools implemented to detect unauthorized changes to software, firmware and information. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | • For a sample of code integrity alerts, obtained and inspected logs and ascertained that the changes were identified by unique event IDs, and appropriate teams were notified to investigate and resolve identified items. | |
| CM - 13 | Any changes to production via break-glass have been reviewed to ensure all changes were appropriate. | • Inquired of management to gain an understanding of the process related to performing review of changes made through break-glass accounts in the production environment.<br>• For all break-glass account access scenarios during the examination period, obtained and inspected tickets to ascertain that access was reviewed for appropriateness. | **Exception Noted:**<br><br>For six of the total population of 100 break-glass alerts, evidence of review by a team member who did not perform the break-glass operation was not retained to verify if appropriate changes were made to the production environment. |
| SDL - 1 | Development of new features and major changes to the Azure platform follow a defined approach based on the Microsoft Security Development Lifecycle (SDL) methodology. | • Inquired of management if the Microsoft SDL methodology for the development of new features and major changes to Microsoft Azure platform is followed.<br>• Obtained and inspected documentation to ascertain that an SDL methodology was defined to incorporate security practices as part of the development process.<br>• For a sample of changes made to production, obtained and inspected tickets to ascertain that documented procedures for testing were followed prior to deployment. | No exceptions noted. |
| SDL - 2 | Applicable operational security and internal control requirements are documented and approved for major releases prior to production deployment. | • Inquired of management regarding the process to identify and document applicable operational security and internal control requirements as part of the SDL process.<br>• For a sample of major releases, ascertained that operational security and internal control requirements were identified, documented, and approved by designated owners. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| SDL - 3 | Responsibilities for submitting and approving production deployments are segregated within the Azure teams. | • Inquired of the service teams if responsibilities for production deployment are segregated within the Microsoft Azure teams.<br>• For a sample of services, inspected access control lists to ascertain that segregation was maintained within the teams for submitting and approving production deployments and that the access to perform production deployments was restricted to authorized individuals within the Azure teams. | No exceptions noted. |
| SDL - 4 | New features and major changes are developed and tested in separate environments prior to production implementation. Production data is not replicated in test or development environments. | • Inquired of the service teams if changes are developed and tested in separate environments prior to production deployment and production data is not replicated in test or development environments.<br>• For a sample of services, obtained and inspected subscription namespaces to ascertain that separate environments existed for development and testing of changes prior to production deployment.<br>• For the sampled services, inquired of service owners and inspected policies, test scripts, or configuration files, as applicable, to ascertain that production data is not replicated to the test or development environments.<br>• For a sample of changes made to production, obtained and inspected tickets to ascertain that documented procedures for testing were followed prior to deployment. | No exceptions noted. |
| SDL - 5 | A centralized repository for managing source code changes to the Azure platform is used. Procedures to authorize Azure personnel to submit source code changes based on their role, are established. Code changes submitted to the centralized repository are logged and can be | • Inquired of the service teams about the access control procedures for source code repository.<br>• For a sample of services, obtained and inspected security groups and membership to ascertain that access to the source code repository was restricted to authorized Azure personnel.<br>• For a sample source code repository, observed the configuration files and a change to ascertain that the identity of the individual and / or system component changing the code, | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | traced to the individuals or system components executing them. | the time of the change, and changes submitted to the source code repository are logged. | |
| SDL - 6 | Source code builds are scanned for malware prior to release to production. | • Inquired of the service teams regarding the procedures in place to scan source code builds for malware.<br>• For a sample of source code builds, obtained and inspected evidence of scan build for malwares to ascertain that malware scanning was performed automatically as part of the build process prior to release to production. | No exceptions noted. |
| SDL - 7 | The SDL review for each service with a major release is performed and completed on a semi-annual basis, and signed off on by designated owners. | • Inquired of management if an SDL review is performed at least semi-annually for each service with a major release and signed off by designated owners.<br>• For a sample of services, obtained and inspected relevant SDL tickets with review and sign-off details to ascertain that an SDL review was completed in the past six months as per the SDL methodology, and sign-offs were obtained from designated owners. | No exceptions noted. |
| VM - 1 | Azure platform components are configured to log and collect security events. | • Inquired of management regarding security event logging configured for Azure services to enable detection of potential unauthorized or malicious activities.<br>• For a sample of services, obtained and inspected configurations and logs to ascertain that logging of key security events was enabled per documented procedures.<br>• Inspected configurations and a sample notification to corroborate that security events generated alerts based on defined rulesets.<br>• Observed the monitoring configuration to ascertain that a mechanism was in place to detect and resolve the activation or stopping of the logging process. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| VM - 2 | Administrator activity in the Azure platform is logged. | • Inquired of management regarding the mechanisms that are in place for logging administrator activities within Azure Service platform.<br>• For a sample of services, obtained and inspected security logs to ascertain that administrator events were logged to the centralized monitoring infrastructure. | No exceptions noted. |
| VM - 3 | A monitoring system to monitor the Azure platform for potential malicious activity and intrusion past service trust boundaries has been implemented. | • Inquired of management regarding the monitoring capabilities within the Azure environment to detect potential malicious activities and intrusions.<br>• For a sample of services, inspected logs to ascertain that malicious activities were monitored as per the process.<br>• Additionally, inspected anti-malware event logging and the status of anti-malware engine signatures to corroborate that they were up to date. | No exceptions noted. |
| VM - 4 | Procedures to investigate and respond to malicious events detected by the Azure monitoring system in a timely manner have been established. | • Inquired of the Microsoft Azure Incident Management Leads to ascertain that incidents and malicious events are identified, tracked, investigated, and resolved in a timely manner per documented procedures.<br>• Obtained and inspected a sample of incident tickets pertaining to the Azure Services and ascertained that incidents and malicious events were monitored, identified, tracked, investigated, and resolved. | No exceptions noted. |
| VM - 5 | Procedures to evaluate and implement Microsoft-released patches to Service components have been established. | • Inquired of management regarding the patch management process within the Azure environment.<br>• Inspected patch management SOP and ascertained that procedures for evaluating and implementing released patches within the Azure environment were established.<br>• For a sample of servers, obtained and inspected logs and patch details to ascertain that a selection of patches was assessed | **Exception Noted:**<br>A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | and implemented into the production environment per documented procedures. | in the documented procedures. In addition, two server-patch samples were missing during the examination period. |
| VM - 6 | Procedures to monitor the Azure platform components for known security vulnerabilities have been established. Identified security vulnerabilities are remediated. | • Inquired of management if processes to monitor and remediate known security vulnerabilities on the Azure platform are in place.<br>• Obtained and inspected the Vulnerability Risk Management SOP and ascertained that procedures for scanning and remediating vulnerabilities identified on servers have been established.<br>• For a sample of Azure platform components, obtained and inspected scan results to ascertain the components were monitored for security vulnerabilities. Further, ascertained that identified security vulnerabilities were remediated. | No exceptions noted. |
| VM - 7 | Procedures to configure and monitor network devices in the scope boundary, and resolve issues, have been established. | • Inquired of the Networking team to ascertain that procedures for configuring and monitoring network devices in the scope boundary are established, and that identified issues are resolved.<br>• Obtained and inspected documentation and ascertained that procedures related to network infrastructure were established and included network device access, configuration management, network device change management, Access Control List (ACL) change management, and ACL triage process. Additionally, ascertained that the procedures were reviewed by the Networking team management on an annual basis.<br>• For a sample of network devices in the scope boundary, obtained and inspected device configurations to ascertain that the devices were in compliance with established standards. For devices that were not in compliance, ascertained that issues were investigated and resolved. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| VM - 8 | Penetration testing of critical infrastructure components is performed at least annually based on documented Penetration testing procedures and findings are documented, tracked, and remediated. | • Inquired of management regarding the procedures established to perform penetration testing on the Azure environment.<br>• Obtained and inspected the contractual agreements and results of the latest penetration testing performed on the Azure environment to ascertain:<br>– Penetration testing was performed by internal personnel or external service providers at least annually<br>– Critical infrastructure components were included in the scope boundary<br>– Findings were documented, tracked and remediated based on severity | No exceptions noted. |
| VM - 9 | Network devices in the scope boundary are configured to log and collect security events, and monitored for compliance with established security standards. | • Inquired of the Networking team to ascertain that network devices in the scope boundary are configured to log and collect security events, and monitored for compliance.<br>• For a sample of network devices in the scope boundary, obtained and inspected device configurations to ascertain that they were configured to log and collect security events, with event logs routed to designated log servers.<br>• Inspected configuration compliance reports for the sampled network devices, and ascertained that scans were configured per established security standards. For devices identified by scanning as not being in compliance, ascertained that issues were investigated and resolved. | No exceptions noted. |
| VM - 10 | Azure provides logging mechanisms that can be configured by customers to log activities and performance metrics. | • Inquired of management to understand the logging mechanisms available to customers, and how these logging mechanisms can be leveraged.<br>• Reperformed the control to ascertain that logging mechanisms can be configured by customers to log activities and performance metrics. Inspected the logs available on the portal and ascertained that expected entries are being logged. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| VM - 11 | Microsoft operating system updates for virtual machines are made available through Microsoft Security Response Center (MSRC) site and Windows Update. | • Inquired of management regarding the mechanisms to update the Microsoft operating system installed on virtual machines through the Microsoft Security Response Center (MSRC) and Windows Update.<br>• Inspected the MSRC to ascertain that updates to the Microsoft operating system on virtual machines are available through the MSRC. Accessed Windows Update and observed that customers can configure virtual machines to update operating systems as needed. Reperformed by configuring automatic updates and through inspection ascertained that updates were applied as a result. | No exceptions noted. |
| VM - 12 | The availability of Azure services is monitored through third-party and internal tools, and the status is communicated through a Service Dashboard. | • Inquired of management to understand the processes followed and tools used by the services for monitoring service availability and communicating service availability status to customers through Service Dashboard.<br>• For a sample of services, inspected monitoring tools and configurations to ascertain that the availability tools were implemented to monitor service availability and generate real-time alerts to notify the designated personnel of any issues.<br>• Inspected the Service Dashboard to ascertain the availability status of services were accurately reflected. | No exceptions noted. |
| VM - 13 | Vulnerabilities for network devices are evaluated and mitigated based on documented procedures. | • Inquired of management if documented procedures are followed when remediating vulnerabilities on network devices.<br>• Obtained and inspected documentation to ascertain if procedures to evaluate vulnerability risks have been established.<br>• For sampled network devices, selected a sample of vulnerabilities and their corresponding remediation procedures to ascertain if applicable and defined mitigation procedures were implemented. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| IM - 1 | An incident management framework with defined processes, roles, and responsibilities for the detection, escalation and response of incidents, has been established and communicated. | • Inquired if information security incidents are managed through designated responsibilities and documented procedures.<br>• Obtained and inspected information security incident management procedures and ascertained that roles and responsibilities for escalation and notification to specialist groups during a security incident were established and communicated. | No exceptions noted. |
| IM - 2 | Events, thresholds, and metrics have been defined and configured to detect incidents and alert the associated Operations team. | • Inquired if events, thresholds and metrics are established to detect and facilitate an alert / notification to incident management teams.<br>• Observed the configuration files and ascertained that automated monitoring and notification was configured for predefined events.<br>• For a sample of platform components, ascertained that automated notifications were received upon the occurrence of an event meeting the configured specifications. | No exceptions noted. |
| IM - 3 | The Operations team performs monitoring, including documentation, classification, escalation, and coordination of incidents per documented procedures. | • Inquired about the procedures for 24x7 monitoring and handling of incidents.<br>• Identified the population of incidents (all severities) in the examination period and obtained and inspected the incident tickets for a sample to ascertain that each incident was handled per documented procedures.<br>• Observed the Operations Center and ascertained monitoring of alerts and notification of potential incidents.<br>• Obtained and inspected Monitoring team schedules to ascertain that there was 24x7 monitoring. | No exceptions noted. |
| IM - 4 | Incident post-mortem activities for severe incidents impacting the Azure environment are conducted. | • Inquired if a post-mortem is performed for customer impacting severity 0 and 1 incidents and a formal report is submitted for management review and that mechanisms are in place to track and remediate recurring incidents. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | • Inspected a sample of incidents to ascertain that post-mortem was performed as per documented procedures. | |
| IM - 5 | The Cyber Defense Operations Center (CDOC) team provides reports of information security events to Cloud + AI management on a quarterly basis. Problem statements for systemic issues are submitted to executive leadership for review. | • Inquired of the Cyber Defense Operations Center (CDOC) team if information security review report is presented to Cloud + AI management on a quarterly basis.<br>• Obtained and inspected a sample of quarterly reports and ascertained that problem statements for systemic issues were submitted for executive leadership review.<br>• Obtained and inspected evidence (such as meeting invite, list of attendees) to ascertain that the report was reviewed by executive leadership. | No exceptions noted. |
| IM - 6 | The Cyber Defense Operations Center (CDOC) team performs annual tests on the security incident response procedures. | • Inquired of the Cyber Defense Operations Center (CDOC) team if incident response procedures are tested at least annually and the test results are documented in centralized tracking system.<br>• Obtained and inspected the documentation from the exercise conducted by the CDOC team including the test plan and testing results and noted that the tested action items, expected results, and actual results were included and documented. | No exceptions noted. |
| PE - 1 | Procedures to restrict physical access to the datacenter to authorized employees, vendors, contractors, and visitors, have been established. | • Inquired of the Datacenter Management team if access levels are established and if physical access to the datacenter is restricted to authorized personnel.<br>• Inspected the datacenter SOPs and ascertained that procedures were in place to restrict physical access to the datacenter for employees, vendors, contractors, and visitors. Inquired of management regarding the review and communication of the procedures.<br>• Obtained and inspected a sample of access requests and ascertained that access requests were tracked using a centralized ticketing system and were authorized by the designated approvers. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| PE - 2 | Security verification and check-in for personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors, are required. | • Inquired of the Datacenter Management team if security verification and check-in procedures are established for personnel requiring temporary access to the interior datacenters.<br>• Inspected the datacenter SOPs and ascertained if procedures were in place for security verification, check-in, and escorting personnel requiring temporary access to the interior of the datacenter facility, including tour groups or visitors. | No exceptions noted. |
| PE - 3 | Physical access to the datacenter is reviewed quarterly and verified by the Datacenter Management team. | • Inquired of the Datacenter Management team if physical access to datacenters is reviewed and verified quarterly.<br>• Inspected Datacenter Services (DCS) operating procedures and ascertained that quarterly access review procedures were documented.<br>• For sampled quarterly access reviews, ascertained that reviews were completed appropriately. | No exceptions noted. |
| PE - 4 | Physical access mechanisms (e.g., access card readers, biometric devices, man traps / portals, cages, locked cabinets) have been implemented and are administered to restrict access to authorized individuals. | • Inquired of the Datacenter Management team if physical access mechanisms to restrict access to authorized individuals are in place.<br>• For a sample of datacenters, observed that access to the main entrance of the datacenter, exterior doors, co-locations, and other interior rooms within the datacenter was restricted through physical access mechanisms (such as electronic card readers, biometric handprint readers, or man traps).<br>• Observed attempts to access restricted areas within the datacenters without appropriate level of access and ascertained that access was denied. | No exceptions noted. |
| PE - 5 | The datacenter facility is monitored 24x7 by security personnel. | • Inquired of the Datacenter Management team if security personnel monitor the datacenter premises through a video surveillance system 24 hours a day, 7 days a week. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | • Observed security personnel as well as video surveillance systems at a sample of datacenters and ascertained that views for facility entrances, exits, parking lots, doors, co-locations, restricted areas and / or loading / delivery docks were being monitored by security personnel using on-site security consoles.<br>• Requested surveillance tapes for a sample of datacenters and inspected that the tapes were retained according to the documented operating procedures. | |
| PE - 6 | Datacenter Management team maintains and tests datacenter-managed environmental equipment within the facility according to documented policy and maintenance procedures. | • Inquired of the Datacenter Management team if environmental equipment within datacenter facilities is maintained and tested according to documented policy and maintenance procedures.<br>• Inspected DCS operating procedures and ascertained that procedures were documented for maintaining adequate facility and environmental protection at the datacenters.<br>• For a sample of datacenters observed that the critical environment was being monitored.<br>• Inspected maintenance and testing records for a sample of on-site environmental equipment. | No exceptions noted. |
| PE - 7 | Environmental controls have been implemented to protect systems inside datacenter facilities, including temperature and heating, ventilation, and air conditioning (HVAC) controls, fire detection and suppression systems, and power management systems. | • Inquired of the Datacenter Management team if environmental controls are implemented to protect systems inside the datacenters.<br>• For a sample of datacenters, observed that environmental controls including temperature control, HVAC (heating, ventilation and air conditioning), fire detection and suppression systems, and power management systems were in place. | No exceptions noted. |
| PE - 8 | Datacenter physical security management reviews and approves the incident response procedures on a yearly basis. The incident security | • Inquired of the physical security management team if an incident response procedure is established to address physical security incidents and methods to report security incidents, and these are reviewed and approved annually. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | response procedures detail the appropriate steps to be taken in the event of a security incident and the methods to report security weaknesses. | • Inspected the Incident Response Procedure and ascertained that the procedure was approved by appropriate Physical Security Managers and included documentation of severity of events, procedures to be followed in the event of a physical security incident and guidelines for emergency communication and reporting. | |
| LA - 1 | External access to Azure services and the customer data stored in the service requires authentication and is restricted based on customer configured authorization settings. | • Inquired of the service teams to understand the mechanisms implemented to allow customers to configure access or traffic restrictions.<br>• Reperformed the control for a sample of services to ascertain that access to the service was restricted based on the customer configured authentication and authorization settings. | No exceptions noted. |
| LA - 2 | Customer credentials used to access Azure services meet the applicable password policy requirements. Temporary credentials assigned to users by the service expire within 14 days and users are forced to change these credentials when using them for the first time. | • Inquired of the service teams regarding controls in place to ascertain the following requirements:<br>– New passwords within Azure conform to the applicable password policy requirements<br>– Users are forced to change the password when using them for the first time<br>– Temporary credentials assigned to users by the service expire within 14 days<br>• Reperformed the control for a sample of services through various scenarios such as:<br>– Providing sample weak passwords<br>– Tampering with the Hypertext Transfer Protocol (HTTP) request by using weak passwords<br>– Using expired passwords<br>to ascertain that new password(s) that did not meet applicable password policy requirements were not accepted. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| LA - 3 | Logical segregation to restrict unauthorized access to other customer tenants is implemented. | • Inquired of the service teams to understand the segregation controls implemented to restrict unauthorized access to other customer tenants.<br>• Reperformed the control for a sample of services to ascertain that segregation was enforced between the tenants, and that customers could access the data within the service only after the required authorization checks. | No exceptions noted. |
| LA - 4 | Customer data that is designated as "confidential" is protected while in storage within Azure services. | • Inquired of the service teams to understand the controls implemented to protect customer confidential data stored within the service.<br>• Reperformed the control for a sample of services to ascertain that customer confidential data stored within the service was protected. | No exceptions noted. |
| LA - 5 | User sessions within Azure can be configured by customers to expire after a stipulated period of inactivity. | • Inquired of management to understand the mechanisms implemented to enforce session timeout.<br>• Reperformed the control to validate that:<br>– Sessions are invalidated after an idle timeout as configured by the user or tenant administrator<br>– Session remains active if timeout is set to 'never' after a long duration | No exceptions noted. |
| LA - 6 | The jobs configured by the customer administrators are executed within thirty (30) minutes of the scheduled job run and are repeated based on the defined recurrence settings. | • Inquired of the service teams to understand the mechanisms in place to execute jobs, configured by the customer administrators, within thirty (30) minutes of the scheduled job run and repeat based on the defined recurrence settings.<br>• Reperformed the control for a sample job to ascertain that jobs configured by the customer administrators were executed within thirty (30) minutes of the scheduled job run and were repeated based on the defined recurrence settings. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| LA - 7 | Quotas on Azure services are enforced as configured by the service administrators to protect against availability related issues. | • Inquired of the service teams to understand the mechanisms in place that allow customers to implement quotas on the service.<br>• Reperformed the control for a sample of services by accessing the Azure Management Portal using a subscription, and ascertained that quotas and rate limits were enforced as configured. | No exceptions noted. |
| LA - 8 | The private root key belonging to the Azure services is protected from unauthorized access. | • Inquired of the service teams regarding the controls in place to protect the private root key, belonging to Azure services, from unauthorized access.<br>• Obtained and inspected security plan for the physical location where private root keys are stored to ascertain that security procedures were established to protect the root key from unauthorized logical or physical access.<br>• For a sample of access requests to the root key, obtained access notification and approval to ascertain that access to root keys were authorized and approved. | No exceptions noted. |
| LA - 9 | Service initializes the resource groups within the management portal based on the customer configured templates.<br>Service allows customers to monitor and control the distribution of system resources created within the resource group in order to prevent resources from being congested. | • Inquired of the service team to understand the mechanisms in place to initialize resource groups within the Azure Management Portal based on the customer configured templates and the mechanisms in place to monitor and control the distribution of the system resource created within the resource group.<br>• Reperformed the control using a subscription and ascertained that the service was initialized based on customer configured templates.<br>• Reperformed the control to ascertain that the distribution of the system resource created within a resource group can be monitored and controlled by customers. | No exceptions noted. |
| LA - 10 | The errors generated during the job execution are monitored and appropriate action is taken based on | • Inquired of the service teams regarding monitoring of errors generated during the job execution and actions taken based on the job settings defined by the customer administrator. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | the job settings defined by the customer administrator. | • Reperformed the control for a sample of services to ascertain that errors generated during the job execution were monitored and actions were taken based on the job settings defined by the customer administrator. | |
| LA - 11 | One Time Passwords (OTPs) used for self-service password reset are randomly generated. OTPs expire after a pre-defined time limit. OTPs sent to the customer administrator are required to be validated before a password change is allowed. SSPR does not display user identifiable information during the password reset. Azure Active Directory password policy requirements are enforced on the new passwords supplied by customer administrators within SSPR portal. New passwords supplied by customer administrators are protected during transmission over external networks. | • Inquired of the service team regarding the controls in place that:<br>– Facilitate random generation of OTPs<br>– Expire OTPs after their usage or after a pre-defined time limit<br>– Validate the OTPs before the password is reset<br>– Restrict transmission of new passwords to secure protocols through various endpoints over external networks<br>– Validate if new passwords within the SSPR portal conform to the Azure Active Directory (Azure AD) password policy requirements<br>• Reperformed the control and obtained sample SMS and email OTPs to ascertain that the characters in the SMS and email were random.<br>• Reperformed the control for various scenarios such as:<br>– Reusing OTP after initially using it to reset passwords<br>– Using OTP after expiration of the pre-defined time limit<br>to ascertain that OTPs expired after a pre-defined time limit, and OTPs sent to the customer administrator were required to be validated before password was allowed to be changed.<br>• Reperformed the control to ascertain that restrictions were in place to prevent use of insecure protocols (e.g., HTTP) for transmission of new passwords over external networks.<br>• Reperformed the control through various scenarios such as:<br>– Providing sample weak passwords through portal | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | to ascertain that new passwords that did not meet necessary password policy requirements were not accepted by the SSPR portal. | |
| LA - 12 | Images may be customized and access to images may be restricted by the customer. Updates to available images are communicated to through customer-facing websites. | • Inquired of the service team to understand how image access can be restricted, customized, and how updates are communicated to customers.<br>• Reperformed the control by creating a customized image and restricting access to the image through the Azure portal.<br>• Inspected communications of updates on customer-facing websites and also inspected the Azure Marketplace and ascertained that a selection of hardened images was available. | No exceptions noted. |
| ED - 1 | Production servers that reside in edge locations are encrypted at the drive level. | • Inquired of the Front Door team to gain an understanding of the encryption mechanism present at the drive level on production servers.<br>• For a sample of production servers, ascertained that BitLocker was running and the Trusted Platform Module (TPM) was enabled. | No exceptions noted. |
| ED - 2 | Intrusion alerts are sent to the operator when physical access to the production servers that reside in edge locations is detected. | • Inquired of the Front Door team to understand the mechanism for detecting and alerting unauthorized physical access to production servers.<br>• For a sample of production servers, obtained and inspected hardware specifications to ascertain that intrusion detection switches were present for the devices and inspected configurations to ascertain that they were enabled and configured to generate alerts upon detecting an intrusion. | No exceptions noted. |
| ED - 3 | All unused IO ports on production servers that reside in edge locations are disabled through the configuration settings at the OS-level. | • Inquired of the Front Door team to understand the configuration settings used to disable unused IO ports on production servers. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | • Obtained and inspected the configuration files for a sample of servers and ascertained that selected IO ports were disabled on the servers. | |
| BC - 1 | Business Continuity Plans (BCP) for critical Azure services, which provide roles and responsibilities and detailed procedures for recovery and reconstitution of systems to a known state per defined Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), have been documented and published. Plans are reviewed on an annual basis, at a minimum. | • Inquired of the Business Continuity group to understand the processes in place for developing and maintaining business continuity plans.<br>• Obtained and inspected the business continuity plans and business impact analysis for a sample of components showing that an RTO / RPO was defined and that there were plans in place for each component.<br>• Obtained and inspected the review and approval of the RTO / RPO and BCP. | No exceptions noted. |
| BC - 3 | Azure has developed a Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure and documentation that includes the defined information security and availability requirements. | • Inquired of the Business Continuity group to understand the processes in place for developing and maintaining business continuity plans.<br>• Obtained and inspected the Business Continuity and Disaster Recovery (BC / DR) Standard Operating Procedure to ascertain that it included the defined information security and availability requirements.<br>• Obtained and inspected the overall business continuity plan to ascertain that it included the defined information security and availability requirements. | No exceptions noted. |
| BC - 4 | The BCP team conducts testing of the business continuity and disaster recovery plans established for Azure services, per the defined testing schedule for different loss scenario. Each loss scenario is tested at least annually. Issues identified during | • Inquired of the Business Continuity group to understand the process in place for testing the business continuity / disaster recovery (BC / DR) plans.<br>• For a sample of Azure services, obtained and inspected the BC / DR testing plan and results documents, including follow-up | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | testing are resolved and plans are updated accordingly. | documentation for any issues identified and ascertained that they were established, reviewed and tested at least annually. | |
| BC - 5 | Risk assessments are conducted to identify and assess business continuity risks related to Azure services. | • Inquired of management to understand the processes in place for identifying and assessing the business continuity risks related to Azure services.<br>• Obtained and inspected the Business Impact Analysis (BIA) and the Business Continuity Risk Assessment to identify that, for a selection of components, the business impact analysis was completed and impacts were assessed for critical services based on revenue and operational considerations. | No exceptions noted. |
| BC - 6 | Procedures for continuity of critical services provided by third-parties have been established. Contracts with third-parties are periodically monitored and reviewed for inconsistencies or non-conformance. Procedures to transition between critical third-parties based on results of monitoring are established. | • Inquired of management to gain an understanding of the Service Level Agreements (SLAs) established for critical services provided by third parties.<br>• Obtained and inspected the SLAs established for critical services provided by third parties, to ascertain that they were established, identified services to be performed, service levels to be provided, and established ownership of security processes.<br>• Obtained and inspected meeting notes and scorecards, as applicable, to ascertain that SLA monitoring was being performed.<br>• Obtained and inspected documentation of exit strategy processes for critical service providers and suppliers to ascertain that procedures to transition between critical third-parties were established. | No exceptions noted. |
| BC - 7 | A Datacenter Business Continuity Management (BCM) program to respond to Microsoft's Enterprise Business Continuance Initiative has been implemented and includes documented procedures for mapping processes to pre-defined | • Inquired of Business Continuity Management team to understand the requirements established by Microsoft's Enterprise Business Continuity Management (EBCM) Program.<br>• Obtained and inspected a selection of Datacenter BCM program documents and ascertained that Datacenter BCM program adhered to BCM PMO standards, methods, policies and metrics. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | enterprise functions, establishing recovery strategies as well as developing and conducting test scenarios that enable the BCM program to mitigate risks and vulnerabilities and respond to major disruptive events. | | |
| BC - 8 | A Datacenter Business Continuity Management Program defines business continuity planning and testing requirements for functions within the datacenters. Datacenters exercise, test and maintain the Datacenter Business Continuity Plan for the continued operations of critical processes and required resources in the event of a disruption at least annually. The 'Business Continuity Management Exercise and Test Program Framework' document establishes the basis and process for exercising and testing of the plans for continuity and resumption of critical datacenter processes. | • Inquired of the Business Continuity Management team if datacenters exercise, test and maintain Business Continuity Plans (BCPs) at least once a year.<br>• Obtained and inspected the Business Continuity Management program documentation and ascertained that recovery strategies and procedures for resumption of critical business processes were documented and that the process for exercising and testing of the plans for continuity and resumption of critical business processes were established.<br>• Obtained and inspected the tests performed or implementation of the plan due to a live event, for a sample of datacenters and ascertained that business continuity plans were tested on an annual basis. | No exceptions noted. |
| BC - 9 | Datacenter Management teams conduct and document a resiliency assessment, specific to the datacenter's operations, on an annual basis or prior to proposed significant changes. | • Inquired of the Business Continuity Management team if a resiliency assessment specific to the operations of datacenters is conducted and operated by management on an annual basis or prior to proposed significant changes.<br>• Selected a sample of datacenters and requested the resiliency assessment and ascertained that:<br>– The Cloud Operations & Innovation (CO+I) Team assigned risk ownership | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | – Development of risk treatment plans to address risks were specific to datacenter operations | |
| BC - 10 | The network is monitored to ensure availability and address capacity issues in a timely manner. | • Inquired of management to understand the procedures established to monitor network capacity.<br>• Obtained and inspected the capacity report for the sampled months to ascertain that the network availability is monitored and that capacity issues are addressed on at least a monthly basis. | No exceptions noted. |
| PI - 1 | Microsoft Azure monitors the transactions invoked by the customer and relays them appropriately to the suitable Resource Provider (RP) end-point. Actions are taken in response to defined threshold events. | • Inquired of Azure service teams to ascertain that suitable measures are in place to monitor transactions invoked by the customer and relay them appropriately to Resource Provider (RP) end-points.<br>• Obtained and inspected monitoring rules, and resulting notifications generated to check that errors in transactions were recorded and reported to required parties in a timely manner. | No exceptions noted. |
| PI - 2 | Microsoft Azure management reviews portal performance monthly to evaluate compliance with customer SLA requirements. | • Inquired of Azure service teams to ascertain that monthly review procedures are established to understand and evaluate portal performance against customer SLA requirements.<br>• Obtained and inspected a sample of monthly scorecards, and ascertained that appropriate performance reviews were performed as per established procedures. | No exceptions noted. |
| PI - 3 | Microsoft Azure performs input validation to restrict any non-permissible requests to the API. | • Inquired of Azure service teams to understand mechanisms to perform input validation to restrict unauthorized access or non-permissible requests.<br>• Reperformed the control to ascertain that invalid input provided by the user generated error messages for non-permissible requests. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| PI - 4 | Microsoft Azure segregates and appropriately provisions the services based on request from customer through the portal / API. | • Inquired of Azure service teams to understand mechanisms to perform request segregation and provision requested services to user accounts.<br>• Reperformed the control to ascertain that service requests were segregated and provisioned based on subscription ID and other request parameters. | No exceptions noted. |
| SOC2 - 1 | Azure assets are classified in accordance with Microsoft Online Services Classification Guidelines. The classification is documented, reviewed, and approved by the authorizing official. | • Inquired of management regarding the procedures related to the identification and classification of key information or data.<br>• For a sample of services, obtained and inspected the current asset classification document and ascertained that it addressed the key data / information used by Microsoft Azure. Additionally, compared the asset classification to the Standard Operating Procedure (SOP) to ascertain whether it aligned with the approved definition criteria in the SOP. | No exceptions noted. |
| SOC2 - 2 | Azure services maintain an inventory of key information assets. Procedures to review the inventory on a monthly basis are established. | • Inquired of management on the process for maintaining and reviewing the inventory of key information or data.<br>• For a sample of months, sampled services and obtained and inspected asset review completion records within the inventory management tool showing monthly review of key information assets. Additionally, obtained email communications to ascertain that changes, if any, were made per the review performed. | No exceptions noted. |
| SOC2 - 3 | Datacenter team controls the delivery and removal of information system components through tickets on the Global Datacenter Operations (GDCO) ticketing system. Delivery and removal of information system components is authorized by system owners. System components / assets are | • Inquired of management to gain an understanding of the process for delivery and removal of assets from datacenters.<br>• Obtained the population of transports (both delivery and removal) performed during the examination period, and judgmentally selected sample transports.<br>• For the sampled transports, obtained and inspected associated evidence (such as tickets, certificates) to ascertain that proper | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | tracked in the GDCO ticketing database. | authorization was obtained prior to asset delivery and / or removal. | |
| SOC2 - 4 | Management has developed and documented a risk assessment policy to address the purpose, scope, roles, responsibilities for managing deviations from the security policies/standards. The risk assessment policy and procedures are reviewed and updated on an annual basis. | • Inquired of management regarding the procedures to manage and review deviations from the security policies/standards.<br>• Obtained and inspected the exception procedures, describing the process followed for handling deviations and exceptions.<br>• Obtained and inspected the review history for the exception policy to ascertain that it is reviewed at least annually. | No exceptions noted. |
| SOC2 - 6 | Azure maintains a Customer Support website that describes the process for customers and other external users to inform about potential security issues and submit complaints. Reported issues are reviewed and addressed per documented incident management procedures. | • Inquired of management regarding the Customer Support Website and the process for addressing reported customer incidents.<br>• Observed Customer Support Website and ascertained that it allowed customers to report security issues or complaints.<br>• Obtained the Incident Management (IcM) tickets for a sample to ascertain that each incident was handled per documented procedures.<br>• Observed the Operations Center and ascertained monitoring of alerts and notification of potential incidents. | No exceptions noted. |
| SOC2 - 7 | Azure maintains and communicates the confidentiality and related security obligations for customer data via the Microsoft Trust Center. Guidelines and recommendations for the secure use of the cloud services, as applicable, are communicated to customers. | • Inquired of management regarding the process for maintaining and communicating confidentiality and related security obligations for customer data, and recommendations for the secure use of cloud services to customers.<br>• Inspected Microsoft Trust Center to ascertain that confidentiality and related security obligations were maintained and communicated to customers and observed that it included security related information and best practices for use of cloud services. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | | • Obtained and inspected changes documented in Microsoft Trust Center to ascertain that changes related to the confidentiality and related security obligations were communicated to customers. | |
| SOC2 - 8 | Azure maintains and distributes an accurate system description to authorized users. | • Inquired of management regarding the procedures for the development, maintenance, and distribution of the system description.<br>• Obtained Microsoft Azure service description and ascertained that it authoritatively described the system.<br>• Observed that the service description was published and communicated to Microsoft Azure employees and relevant third-parties. | No exceptions noted. |
| SOC2 - 9 | Azure maintains and notifies customers of potential changes and events that may impact security or availability of the services through an online Service Dashboard. Changes to the security commitments and security obligations of Azure customers are updated on the Azure website in a timely manner. | • Inquired of management regarding the process for notifying customers of security and availability events through the Service Dashboard. Additionally, inquired about the process for updating customers of changes to security commitments and obligations in a timely manner.<br>• Observed the customer Service Dashboard and ascertained that it was updated with availability and customer events.<br>• Selected a sample incident ticket to ascertain that the incident was reflected in the Service Dashboard's history.<br>• Observed the security commitments and obligations on the Microsoft Azure website and ascertained that they accurately reflected the security policies and procedures currently in place for the Microsoft Azure environment. | No exceptions noted. |
| SOC2 - 10 | Prior to engaging in Azure services, customers are required to review and agree with the acceptable use of data and the Azure service, as well as security and privacy | • Inquired of management regarding the procedures for the identification of security requirements and how customers must meet these requirements prior to gaining access to Microsoft Azure. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | requirements, which are defined in the Microsoft Online Services Terms, Microsoft Online Subscription Agreement, Azure service Privacy Statement and Technical Overview of the Security Features in Azure service. | • Obtained and inspected the End User Licensing Agreement (EULA) or Customer Agreements required by customers to sign / agree to prior to gaining access, and ascertained that they addressed identified security requirements.<br>• Created a test subscription to ascertain that agreements were required to be signed prior to subscription creation. | |
| SOC2 - 11 | Microsoft has defined disciplinary actions for employees and contingent staff that commit a security breach or violate Microsoft Security Policy. | • Inquired of the HR team that:<br>– Disciplinary actions for employees and contingent staff, who commit a security breach or violate Microsoft Security Policy, have been established<br>– The policy is communicated to the employees and relevant external parties<br>• Obtained and inspected the HR policy and agreements, and ascertained that disciplinary actions were included for employees and contingent staff who commit a security breach or violate Microsoft Security Policy. | No exceptions noted. |
| SOC2 - 12 | Microsoft personnel and contingent staff undergo formal screening, including background verification checks, as a part of the hiring process prior to being granted access. Additional screening is conducted in accordance with customer specific requirements, for employees with access to applicable data. | • Inquired of the Human Resources (HR) team if procedures were established to perform background checks on new or transferred Microsoft personnel before they were granted access to data and assets.<br>• Obtained and inspected procedures document to ascertain that background screening performed included verification of personal and professional history.<br>• Obtained the total population of new hires from the HR system from the examination period. Selected a sample of new hires to ascertain that background checks were performed prior to access being granted to critical data / applications. | No exceptions noted. |
| SOC2 - 13 | Microsoft requires employees and contractors to sign agreements that include non-disclosure provisions | • Inquired of the Human Resources (HR) team if Non-Disclosure Agreements (NDAs), that include asset protection and return | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | and asset protection responsibilities, upon hire. In addition, employees are provided Microsoft's Employee Handbook, which describes the responsibilities and expected behavior with regard to information and information system usage. Employees are required to acknowledge agreements to return Microsoft assets upon termination. | responsibilities, were signed as a part of the onboarding process.<br>• Inspected a sample NDA to ascertain that the agreement included requirements for asset protection, and asset return upon termination of employment.<br>• Obtained the total population of new hires from the HR system from the examination period. Selected a sample of new hires to ascertain that NDAs were signed at the time of onboarding.<br>• Obtained and inspected the Reporting Concerns About Misconduct policy, to ascertain if policies around notification of incidents were documented. | |
| SOC2 - 14 | Requirements for confidentiality or non-disclosure agreements reflecting the organization's needs for the protection of information, should be identified and regularly reviewed. | • Inquired of management regarding the process for requiring employees, contractors, and third-party users to follow established security policies and procedures.<br>• Inquired of management on the process for identifying and reviewing requirements that were included in the confidentiality or non-disclosure agreements.<br>• Identified the population of individuals that were new to the Microsoft Azure environment.<br>• Obtained and inspected the security policy and procedure agreements signed by an employee, contractor, or third party for a sample of new users. | No exceptions noted. |
| SOC2 - 15 | Azure has established baselines for OS deployments.<br>Azure employs mechanisms to re-image production servers with the latest baseline configurations at least once a month or detect and troubleshoot exceptions or deviations from the baseline configuration in the production | • Inquired of management regarding the baseline process for Azure services, including scanning environments for baseline compatibility.<br>• Obtained and inspected the baseline configurations to ascertain that baselines were established and reviewed on an annual basis.<br>• For a sample of services, obtained a completed baseline scan from the period or log of monthly reimaging. Inspected scan | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | environment. The Azure OS and component teams review and update configuration settings and baseline configurations at least annually. | results and obtained corresponding justifications for differences or documented resolutions. | |
| SOC2 - 18 | Relevant statutory, regulatory, and contractual requirements and the organization's approach to meet these requirements for each information system and the organization, should be explicitly defined, documented, and kept up to date. | • Inquired of management regarding the procedures in place for identifying relevant statutory, regulatory, and contractual requirements, and making relevant updates to documentation or procedures accordingly.<br>• Obtained and inspected calendar invite and the meeting minutes for the meetings between the Azure Global and Corporate, External, and Legal Affairs (CELA) teams to ascertain that they occurred on a regular basis.<br>• Obtained and inspected policy, procedure, and agreement documents to ascertain that they included relevant and current statutory, regulatory, and contractual requirements. | No exceptions noted. |
| SOC2 - 19 | A compliance program is managed with representation from various cross-functional teams and external parties to identify and manage compliance with relevant statutory, regulatory and contractual requirements. | • Inquired of management regarding the process in place for managing compliance with relevant statutory, regulatory and contractual requirements, with the involvement of various cross-functional teams including Corporate, External, and Legal Affairs (CELA), and Azure Global.<br>• Obtained and inspected meeting invites and meeting minutes to ascertain that the meeting between Azure Global and various cross-functional teams such as CELA, and external parties such as government agencies, occurred on a regular basis.<br>• Observed CELA communications regarding regulatory compliance to ascertain that it addressed relevant statutory, regulatory and contractual requirements. | No exceptions noted. |
| SOC2 - 20 | Azure performs periodic Information Security Management System (ISMS) reviews and reviews results | • Inquired of management regarding the process for performing the Information Security Management System (ISMS) review. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | with management. This involves monitoring ongoing effectiveness and improvement of the ISMS control environment by reviewing security issues, audit results, and monitoring status, and by planning and tracking necessary corrective actions.<br><br>Audit activities are planned and agreed upon in advance by stakeholders and any access required to perform the audits requires approval. | • Inquired of management regarding the process for planning and performing audit activities.<br>• Obtained and inspected the latest ISMS review to ascertain that the review was performed and results, including scope and applicability, were reviewed with management.<br>• Obtained audit and compliance meeting invites, decks and newsletters to ascertain that audit activities were planned and reviewed with management prior to executing any audits. | |
| SOC2 - 25 | Security risks related to external parties (such as customers, contractors and vendors) are identified and addressed within the Azure environment based on Microsoft's corporate procurement process. Designated responsibilities are defined to coordinate with relevant corporate groups (e.g., Corporate, External, and Legal Affairs, Procurement) in reviewing risks associated with external parties and establishing relevant agreements. | • Inquired of management regarding the risk assessment process and how risks are identified and addressed related to external parties (such as customers, contractors and vendors).<br>• Obtained and inspected the latest risk assessment performed by Microsoft Azure management to ascertain that it was complete.<br>• Obtained and inspected the Statement of Work (SOW) template citing external parties' access was restricted authoritatively based on the risk assessment performed. | No exceptions noted. |
| SOC2 - 26 | Microsoft Azure performs an annual risk assessment that covers security, continuity, and operational risks. As part of this process, threats to security are identified and | • Inquired of management on the annual risk assessment process and how security, continuity and operational risks are addressed. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | risks from these threats are formally assessed. | • Obtained the risk management framework to ascertain that procedures for identifying, assessing and monitoring risks were established.<br>• Obtained and inspected the risk assessment reports for the latest risk assessment performed by Microsoft Azure management for the identified risk domains, to ascertain that threats to security were identified and the risk from these threats was assessed. | |
| SOC2 - 27 | Microsoft Azure undergoes independent audits and assessments, to monitor and verify compliance with security requirements, at least annually. Findings are recorded, reviewed, prioritized, and remediation plans are developed. | • Inquired of management regarding the various independent audits and assessments performed at least annually.<br>• Obtained audit results and ascertained that findings were recorded, reviewed, prioritized, and remediation plans were developed. | No exceptions noted. |
| SOC2 - 28 | Customer data is accessible within agreed upon services in data formats compatible with providing those services. | • Inquired of management regarding the accessibility of data from agreed upon services in data formats compatible with the services.<br>• Selected a sample of services and obtained the published lists of data formats that the services support.<br>• For a sample of data formats, observed the extraction of data and ascertained that customer data was accessible in the data formats. | No exceptions noted. |
| CCM - 1 | Microsoft Azure has established policies for mobile computing devices to meet appropriate security practices prior to being connected to the production environment. | • Inquired of management that a documented policy exists that specifies the rules and requirements applicable to mobile computing devices.<br>• Obtained and inspected Azure's mobile computing policy to ascertain that it included applicable information security requirements. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| CCM - 2 | Microsoft Azure has included a clear desk and clear screen policy which users are provided as a part of onboarding. | • Inquired of management that a documented clear desk and clear screen policy exists.<br>• Obtained and inspected Microsoft Azure's clear desk and clear screen policy and ascertained that it addressed applicable information security requirements. Additionally, ascertained that the policy was communicated to users as a part of the on-boarding process. | No exceptions noted. |
| CCM - 3 | Azure has established an Audit Log Management policy. Log and monitor access is restricted to only authorized staff with a business need to access such systems. | • Inquired of management regarding policies and procedures in place for audit log management, particularly pertaining to the collection, protection, and retention of these logs.<br>• Obtained documented policies and procedures for audit log management within Microsoft Azure and inspected documentation to ascertain that procedures for collection, protection, and retention of audit logs were documented.<br>• Obtained and inspected immutability configuration settings to ascertain that audit logs cannot be modified and are retained as per the documented procedures.<br>• Obtained and inspected the configuration setting to ascertain timely deletion of logs after the retention period. | No exceptions noted. |
| CCM - 4 | Microsoft Azure components are configured to use Coordinated Universal Time (UTC) time and the clocks are synchronized with the domain controller server. | • Inquired of management regarding the procedures in place for time synchronization across the various Azure components. Additionally, inquired if Azure uses a centralized synchronized time-service protocol (such as Network Time Protocol (NTP)), which synchronizes with UTC, to ascertain that systems, including domain controllers have a common time reference.<br>• Observed mechanisms used by Azure including configurations to sync time and clocks across the Azure components, including domain controllers, to UTC. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| CCM - 5 | Microsoft Capacity Management team projects future capacity requirements based on internal operational reports, revenue forecasts and inputs from internal component teams. | • Inquired regarding the capacity planning process and process to review the capacity model with management.<br>• Obtained and inspected the monthly capacity planning review decks pertaining to capacity planning to ascertain that the necessary parameters were reviewed and considered during the capacity planning. | No exceptions noted. |
| CCM - 6 | Azure has published a standard set of APIs with an ecosystem of tools and libraries on the Azure Portal. | • Inquired of management regarding the list of Application Programming Interfaces (APIs) that Azure offers to customers.<br>• Inspected the Azure API reference webpage to ascertain that the list of APIs offered by Azure to customers were published in a centralized repository (webpage) and were as per the industry standards. | No exceptions noted. |
| CCM - 9 | Microsoft Azure has established forensic procedures to support potential legal action after an information security incident. | • Inquired of management regarding the forensic procedures in place for preservation and presentation of evidence, to support potential legal action after an information security incident.<br>• Obtained and inspected forensic procedures and ascertained that procedures and methodologies for gathering and securing evidences were defined. | No exceptions noted. |
| C5 - 1 | Standard Operating Procedures (SOPs), that define the procedures required to operate and maintain the Service environment, have been established and communicated to employees. SOPs are reviewed and approved annually by appropriate management. | • Inquired of management regarding the process for establishing, maintaining, updating and reviewing Standard Operating Procedures.<br>• Obtained and inspected the latest Standard Operating Procedures (SOPs) to ascertain they included appropriate attributes, and were reviewed and approved in a timely manner. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| C5 - 2 | Prior to contracting with Microsoft, suppliers undergo a risk assessment based on the services that will be provided and data handled. List of reviewed suppliers is maintained and their risk profiles are reviewed at least annually. | • Inquired of management to gain an understanding of risk assessment performed prior to contracting with suppliers and the process for maintaining the directory of suppliers including their risk profile.<br>• Obtained and inspected the directory of suppliers to ascertain that it contained basic supplier information including their risk profile. Additionally, obtained and inspected documented procedures related to performing risk assessment of suppliers to ascertain that the assessment was based on the services provided and data handled.<br>• For a sample of suppliers, obtained and inspected the risk assessment report to ascertain that the supplier's risk profile aligned with the services provided and data handled by the suppliers. Additionally, ascertained that the risk profiles were reviewed at least on an annual basis. | No exceptions noted. |
| C5 - 3 | The architecture of the Azure production network is documented as part of the inventory process. Metadata describing the network attributes (i.e. location, tier, and connections) are dynamically generated and updated as part of standard operations. | • Inquired of management regarding the procedures in place to document and update the architecture of the Azure production network.<br>• Obtained and inspected network overview documentation including metadata and network inventory listings to ascertain that the architecture of the Azure production network was established, detailed the essential network attributes, and was updated as part of standard operations. | No exceptions noted. |
| C5 - 4 | Procedures to evaluate government investigative demands for customer data are established and documented. Procedures include a review and assessment by the Microsoft legal department, which will evaluate the legal basis for the request to determine what response is required, notify the impacted | • Inquired of management to understand the procedures established to evaluate, review, notify and respond to government investigative demands for customer data.<br>• Obtained and inspected the procedures established for government investigative demands for customer data and ascertained that they were reviewed on an annual basis. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
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| | customer where permitted by law, where Microsoft is required to produce customer data, work with engineering to collect and produce the minimum data responsive to the request as required by law. Procedures are reviewed at least annually. | | |
| C5 - 5 | Customer metadata is collected, retained, and removed based on the documented procedures. | • Inquired of management to understand the process regarding customer metadata collection, retention and deletion.<br>• Inspected configurations to ascertain that mechanisms existed for collecting, retaining and deleting customer metadata in accordance with documented procedures. | No exceptions noted. |
| C5 - 6 | Logging servers are required to authenticate over encrypted channel to access logs generated within the production environment. Access to logging and monitoring infrastructure is restricted to authorized personnel. | • Inquired of management to understand the process and mechanism in place for enforcing authenticated access to the logging and monitoring infrastructure.<br>• Through observation and inspection of security configurations, ascertained that mechanisms existed for logging servers to establish an authenticated connection with the logging infrastructure and that it takes place over an encrypted channel.<br>• Through inspection ascertained that only authorized individuals were part of the security group that had access to logging and monitoring infrastructure. | No exceptions noted. |
| C5 - 7 | Availability of logging and monitoring software is monitored by internal tools on a continuous basis, and responsible personnel is notified in case of any failure. | • Inquired of management to understand the procedures in place for monitoring availability of the logging and monitoring infrastructure.<br>• Through inspection, ascertained that automated mechanisms were in place to continuously identify unavailability of the logging and monitoring infrastructure, and route incidents to appropriate personnel for resolution. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| ELC - 1 | Microsoft's values are accessible to employees via the Values SharePoint site and are updated as necessary by management. | • Inquired of management regarding Microsoft's values and the process for updating and making them accessible to employees.<br>• Observed the Values SharePoint site and ascertained that Microsoft's values are defined, updated as needed, and published to employees. | No exceptions noted. |
| ELC - 2 | Microsoft Compliance & Ethics team updates the Standards of Business Conduct (SBC) as necessary and the Code is made available internally and externally. The SBC reflects Microsoft's continued commitment to ethical business practices and regulatory compliance. Compliance & Ethics team provides an annual Standards of Business Conduct training course that is mandatory for all employees. Employees who do not complete the training on time are tracked and followed up with appropriately. | • Inquired of the Microsoft Compliance & Ethics team to ascertain that Standards of Business Conduct (SBC) is established and made available internally and externally.<br>• Obtained and inspected the Standards of Business Conduct to ascertain that the Code included Microsoft's continued commitment to ethical business practices and regulatory compliance.<br>• For a sample of employees, obtained the SBC training completion status, including, where applicable, any follow-up documentation for employees who did not complete the training on time. | No exceptions noted. |
| ELC - 3 | Microsoft maintains several mechanisms (email, phone, fax, website) that permit employees and non-employees to communicate confidential and / or anonymous reports concerning Business Conduct. | • Inquired of Microsoft Compliance & Ethics team regarding the mechanisms (email, phone, fax, website) that permit reporting of issues related to Business Conduct.<br>• Accessed each communication mechanism to ascertain that the mechanisms were available and functioning. | No exceptions noted. |
| ELC - 4 | The Audit Committee (AC) reviews its Charter and Responsibilities on an annual basis, as listed in its calendar. The AC Responsibilities include meeting with the external | • Inquired of the members of the Audit Committee (AC) to gain an understanding of the Charter and Responsibilities of the Audit Committee and its annual review process. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | and internal auditors on a quarterly basis, providing oversight on the development and performance of controls, and completing an annual self-evaluation. | • Obtained and inspected the agenda or meeting minutes to ascertain the annual review of Audit Committee's Charter and Responsibilities Calendar.<br>• Inspected the investor relations website to ascertain that the Audit Committee's Charter and Responsibilities Calendar was published on the website.<br>• Obtained evidence (e.g., meeting invite, meeting minutes) to ascertain quarterly meetings between AC and internal / external auditors. | |
| ELC - 5 | Internal Audit Charter directs Internal Audit to provide independent and objective audit, investigative, and advisory services designed to provide assurance that the company is appropriately addressing its risks. The scope and frequency of assurance activities is based on an annual risk assessment. | • Inquired of management to gain an understanding of the Internal Audit Charter and the scope and frequency of assurance activities performed by Internal Audit.<br>• Obtained and inspected the Internal Audit Charter and ascertained that the Charter directs the services of the Internal Audit.<br>• Obtained and inspected the Internal Audit plan and ascertained that the assurance activities are based on an annual risk assessment. | No exceptions noted. |
| ELC - 6 | Management expects outsourced providers to meet certain levels of skills and experience, depending on the role and holds them accountable to achieving specific deliverables, as outlined in a Statement of Work. Outsourced providers are trained to understand and comply with Microsoft's supplier code of conduct. | • Inquired of management regarding the process for:<br>– Citing expectations from outsourced providers to achieve specific deliverables<br>– Training outsourced providers on Microsoft's supplier code of conduct<br>• Obtained and inspected Microsoft's SOW template to ascertain that it cited outsourced providers' role and accountability in achieving specific deliverables.<br>• Inspected the supplier procurement website to ascertain that Microsoft's supplier code of conduct is available and accessible to all outsourced providers. | No exceptions noted. |

| Control ID | Control Activity | Test Procedures | Results of Tests |
|---|---|---|---|
| | | • Observed during the supplier access provisioning process that completion of the supplier code of conduct training is required. | |
| ELC - 7 | Employees hold periodic "connects" with their managers to validate they are on the expected career path and facilitate greater collaboration. Employees also review their performance against their documented deliverables (priorities) and discuss the results with their managers. | • Inquired of the Human Resources (HR) team that periodic connects take place at least annually, where employee's commitments are evaluated by his or her manager.<br>• Obtained and inspected the documentation of a sample periodic connect to ascertain that it included an evaluation of the employee's performance against the documented deliverables (priorities).<br>• For a sample of employees, obtained evidence of occurrence of periodic connects to ascertain that the connects occurred at least annually. | No exceptions noted. |
| ELC - 8 | The Compensation Committee is responsible for reviewing and discussing plans for executive officer development and corporate succession plans for the CEO and other executive officers. | • Inquired of the members of the Compensation Committee to gain an understanding of the process for planning of executive officer development and corporate succession plans for the CEO and other executive officers.<br>• Obtained and inspected the agenda or meeting minutes to ascertain the annual discussion of the succession plans.<br>• Inspected the Compensation Committee Charter on the investor relations website to ascertain that the Compensation Committee's responsibility included reviewing the succession plan for CEO and other executive officers, on an annual basis. | No exceptions noted. |
| ELC - 9 | The Enterprise Risk Management Office (ERMO) has established an entity wide risk assessment process to identify and manage risks across Microsoft. Risk assessment results are reviewed bi-annually and risks that exceed acceptable thresholds are reported to the Board of Directors on behalf of senior management. | • Inquired of the Enterprise Risk Management (ERM) team on the ERM risk assessment process and how risks are identified and managed.<br>• Obtained and inspected the agenda or meeting minutes to ascertain that the ERM risk assessment results are reviewed bi-annually and presented to the Board of Directors for review and consideration of the changes. | No exceptions noted. |

# Section V: Supplemental Information Provided by Microsoft

# Section V: Supplemental Information Provided by Microsoft

The following information is provided for informational purposes only and has not been subjected to the procedures applied in the examination. Accordingly, Deloitte & Touche LLP expresses no opinion on the following information.

### Azure Compliance

Microsoft Azure supports compliance with a broad set of industry-specific laws and meets broad international standards. Azure has ISO 27001, ISO 27017, ISO 27018, ISO 22301, and ISO 9001 certifications, PCI DSS Level 1 validation, SOC 1 Type 2 and SOC 2 Type 2 attestations, HIPAA Business Associate Agreement, and HITRUST certification. Operated and maintained globally, Microsoft Azure is regularly and independently verified for compliance with industry and international standards, and provides customers the foundation to achieve compliance for their applications. More information is available from the Azure Compliance site.

### Infrastructure Redundancy and Data Durability

Azure mitigates the risk of outages due to failures of individual devices, such as hard drives or even entire servers through the following:

- Data durability of Azure Storage (Blobs (including Azure Data Lake Storage Gen2), Disks, Files, Queues, Tables) including Cool and Premium, facilitated by maintaining redundant copies of data on different drives located across fully independent physical storage subsystems. Copies of data are continually scanned to detect and repair bit rot.
- Cloud Services availability, maintained by deploying roles on isolated groupings of hardware and network devices known as fault domains. The health of each compute instance is continually monitored and roles are automatically relocated to new fault domains in the event of a failure.
- Network load balancing, automatic OS and service patching is built into Azure. The Azure application deployment model also upgrades customer applications without downtime by using upgrade domains, a concept similar to fault domains, which helps ascertain that only a portion of the service is updated at a time.

### Data Backup and Recovery

In addition to the core data durability built into Azure, Azure provides customers with a feature to capture and store point-in-time backups of their stored Azure data. This allows customers to protect their applications from an event of corruption or unwanted modification or deletion of its data.

### Microsoft Azure E.U. Data Protection Directive

Microsoft offers contractual commitments for the safeguarding of customer data as part of the Online Services Terms (OST) Microsoft Licensing Terms and Documentation:

- A Data Processing Agreement that details our compliance with the E.U. Data Protection Directive and related security requirements for Azure core features within ISO / IEC 27001:2013 scope.
- E.U. Model Contractual Clauses that provide additional contractual guarantees around transfers of personal data for Azure core features within ISO / IEC 27001:2013 scope.

## Additional Resources

The following resources are available to provide more general information about Azure and related Microsoft services:

- Microsoft Azure Home - General information and links to further resources about Azure: http://azure.microsoft.com
- Microsoft Trust Center includes details regarding Compliance, Service Agreement and Use Rights, Privacy Statement, Security Overview, Service Level Agreements, and Legal Information http://www.microsoft.com/en-us/trustcenter
- Azure Documentation Center - Main repository for developer guidance and information: https://azure.microsoft.com/en-us/documentation
- Microsoft's Security Development Lifecycle - SDL is Microsoft's security assurance process that is employed during the development of Azure: https://www.microsoft.com/en-us/securityengineering/sdl/
- Microsoft's Global Datacenters is the group accountable for delivering a trustworthy, available online operations environment that underlies Microsoft Azure: https://azure.microsoft.com/en-us/global-infrastructure/
- Microsoft Security Response Center - Microsoft security vulnerabilities, including issues with Azure, can be reported to: https://www.microsoft.com/en-us/msrc or via email to secure@microsoft.com

## Management's Response to Exceptions Noted

The table below contains Management's response to the exceptions identified in Section IV - Information Provided by Independent Service Auditor Except for Control Activities, SOC2 Criteria, CCM Criteria, and C5 Objectives Mappings above.

| Control ID | Control Activity | Exception Noted | Management Response |
|---|---|---|---|
| OA - 3 | Procedures to automatically disable Active Directory (AD) accounts and manually remove any non-AD accounts upon user's leave date are in place. | A total of 28 samples for access revocation to production domains and 34 samples for access revocation to the corporate domain (Active Directory) were tested during the portion of the period April 1, 2021 to September 30, 2021. Out of the samples tested during this period, 3 users did not have their access to production and corporate (Active Directory) domains revoked in a timely manner.<br><br>Sampled 8 more users each for access revocation to production and corporate domains subsequent to September 30, 2021 and no | The accounts were not terminated timely due to upstream HR dependencies. The managers did not submit the termination date in the HR system timely. Shortly after the termination date was entered, the Active Directory and domain accounts were automatically disabled. For the sampled accounts, management confirmed there was no access to production resources subsequent to the termination date. As such, management deems there was no risk as a result of the exception. |

| Control ID | Control Activity | Exception Noted | Management Response |
|---|---|---|---|
| | | additional exceptions were noted. | |
| OA - 15 | Passwords used to access Azure network devices are restricted to authorized individuals based on job responsibilities and changed on a periodic basis. | For eight of 25 sampled network devices, evidence related to password rotation was not retained and not available for inspection to corroborate that the passwords were changed on a periodic basis. | Two of the eight sampled network devices identified as exceptions required an additional approval that delayed the rotation. The remaining six devices were affected by a bug in the automated workflow which prevented the password rotation for these network devices to be within the expected frequency.<br><br>Management has committed to implement a process to monitor and detect for bugs that cause the workflow to fail and remediate in a timely manner. In addition, Azure Compliance has implemented a periodic review to detect devices that need to be prioritized by the service team for password rotation.<br><br>Although evidence of password rotation could not be provided, the affected accounts are break-glass accounts that can only be accessed when the central authentication system is down. At no point during the audit period was the authentication system down, therefore no accounts could have been accessed. As such, management deems there was no risk as a result of the exception. |
| DS - 1 | Cryptographic certificates, keys, and customer access keys used for communication between Azure services and other internal components are stored securely and are rotated on a periodic basis. | One of 15 sampled secrets during the portion of the period April 1, 2021 to September 30, 2021, was not rotated as per the secret's rotation cadence defined in the documented procedures.<br><br>Sampled 12 secrets subsequent to September 30, 2021 and no additional exceptions were noted. | The secret noted was a connection string to a database containing non-customer related metadata created for migration purposes prior to the audit period. After migration was completed, the service team no longer used the secret and was retained in an encrypted storage platform. The service team inspected their production environment and verified the connection string was not being utilized. The service team has since deleted the connection string and will remove all decommissioned secrets from the repository to avoid recurrence of the finding. As such, |

| Control ID | Control Activity | Exception Noted | Management Response |
|---|---|---|---|
| | | | management deems there was no risk as a result of the exception. |
| VM - 5 | Procedures to evaluate and implement Microsoft-released patches to Service components have been established. | A total of 53 server-patch samples related to manual patching process were tested. Out of the samples tested, deployment of one server-patch sample was delayed and did not meet the patch deployment timelines defined in the documented procedures. In addition, two server-patch samples were missing during the examination period. | The three server-patch samples are all up-to-date and running the latest versions. An analysis was performed over the periods where the patches were missing to confirm there were no incidents that would have been prevented by installing the missing patches. The service teams have updated their patching process to adhere to the timely installation of patches. |
| CM - 13 | Any changes to production via break-glass have been reviewed to ensure all changes were appropriate. | For six of the total population of 100 break-glass alerts, evidence of review by a team member who did not perform the break-glass operation was not retained to verify if appropriate changes were made to the production environment. | Azure Compliance performed a look back analysis over the one year audit period and a total of six instances where evidence of a secondary review was not retained. For those six instances, evidence was provided showing the actions performed during the break glass sessions were pre-planned and approved by other members of the team prior to the break-glass sessions. The activities performed in each instance were administrative that did not involve any code changes and an automated incident ticket was generated and made available for the broader team to review.<br><br>Azure Compliance team has implemented periodic monitoring to detect if a secondary review did not occur in a more timely manner. |

## User Entity Responsibilities

The following list includes user entity responsibilities that Microsoft assumes its user entities have implemented, but are not required to meet the criteria. User entities and other interested parties should determine whether the user entities have established sufficient controls in these areas:

- Customers are responsible for managing compliance with applicable laws / regulations.
- Customers are responsible for establishing appropriate controls over the use of their Microsoft Accounts and passwords.

- Customers are responsible for disabling / deleting account access to their Azure services upon employee and contractor role change or terminations.
- Customers are responsible for implementing workstation timeout for extended periods of inactivity.
- Customers are responsible for reviewing the access activities associated with their accounts and their VM applications.
- Customers are responsible for protecting the credentials associated with their deployment profiles.
- Customers are responsible for following appropriate security practices during development and deployment of their applications on Azure Web Apps.
- Customers are responsible for configuring their Web Apps deployments to log appropriate diagnostic information and monitoring for security related events.
- Customers are responsible for specifying strong credentials used with service identities and management service accounts and managing them for continued appropriateness.
- Customers are responsible for ensuring the supervision, management and control for access to key systems hosted in the Azure environment.
- Customers are responsible for verifying the security of patching, and maintaining any third party applications and / or components that they install on the Azure production environment.
- Customers' administrators are responsible for the selection and use of their passwords.
- Customer entities are responsible for notifying the MFA service of changes made to technical or administrative contact information.
- Customers are responsible for maintaining their own system(s) of record.
- Customers are responsible for ensuring the supervision, management and control of the use of MFA services by their personnel.
- Customers are responsible for developing their own Disaster Recovery and Business Continuity Plans that address the inability to access or utilize MFA services.
- Customers are responsible for ensuring the confidentiality of any user IDs and passwords used to access MFA systems.
- Customers are responsible for ensuring that user IDs and passwords are assigned to authorized individuals.
- Customers are responsible for ensuring that the data submitted to the MFA service is complete, accurate and timely.
- Customers are responsible for immediately notifying the MFA service of any actual or suspected information security breaches, including compromised user accounts.
- Customers are responsible for determining, implementing and managing encryption requirements for their data within the Azure platform where Azure does not enable it by default and / or can be controlled by the customer.
- Customers are responsible for securing certificates used to access Azure SMAPI.
- Customers are responsible for selection of the access mechanism (i.e., public or signed access) for their data.
- Customers are responsible for determining the configurations to be enabled on their VMs.
- Customers are responsible for backup of their data from Azure to local storage upon Azure subscription termination.
- Customers are responsible for appropriate protection of the secrets associated with their accounts.

- Customers are responsible for designing and implementing interconnectivity between their Azure and on-premises resources.
- Customers are responsible for specifying authorization requirements for their internet-facing messaging end points.
- Customers are responsible for encrypting content using the SDK provided by Media Services.
- Customers are responsible for the rotation of DRM and content keys.
- Customers are responsible for following a Secure Development Lifecycle methodology for their applications developed on Azure.
- Customers are responsible for application quality assurance prior to promoting to the Azure production environment.
- Customers are responsible for monitoring the security of their applications developed on Azure.
- Customers are responsible for reviewing public Azure security and patch updates.
- Customers not signed up for auto-upgrade are responsible for applying patches.
- Customers are responsible for reporting to Microsoft the incidents and alerts that are specific to their systems and Azure.
- Customers are responsible to support timely incident responses with the Azure team.
- Customers are responsible for designing and implementing redundant systems for hot-failover capability.
- Customers are responsible to assign unique IDs and secured passwords to users and customers accessing their instance of the API Management service.
- Customers are responsible to secure their API using mutual certificates, VPN or the Azure ExpressRoute service.
- Customers are responsible for using encrypted variable asset to store secrets while utilizing the Automation service.
- Customers are responsible for reviewing the access activities associated with their Intune enrolled devices.
- Customers are responsible for determining and implementing encryption requirements for their Intune enrolled devices and on-premises resources.
- Customers are responsible for securing certificates used to access Intune (iOS Onboarding certificate, Windows Phone Code Signing Certificates for Windows Phone, any certificate used to sign Enterprise Windows Applications, and Certificate Registration Point (CRP) Signing certificates used in VPN / WiFi Profiles).
- Customers are responsible for determining the applications and policies to be deployed to their Intune enrolled devices.
- Customers are responsible for designing and implementing interconnectivity between their Intune subscription and on-premises resources (specifically any VPN infrastructure, System Center Configuration Manager infrastructure, and the Exchange Connector).
- Customers utilizing the Azure ExpressRoute service are responsible for ensuring their on-premises infrastructure is physically connected to their connectivity service provider infrastructure.
- Customers are responsible for ensuring the service with their connectivity provider is compatible with the Azure ExpressRoute service.
- Customers are responsible for ensuring that their connectivity provider extends connectivity in a highly available manner so that there are no single points of failure.

- Customers utilizing the Azure ExpressRoute service are responsible to set up redundant routing between Microsoft and the customer's network to enable peering.
- Customers co-located with an exchange or connecting to Microsoft through a point-to-point Ethernet provider are responsible to configure redundant Border Gateway Protocol (BGP) sessions per peering to meet availability SLA requirements for Azure ExpressRoute.
- Customers are responsible for appropriate setup and management of Network Address Translation (NAT) to connect to Azure services using Azure ExpressRoute.
- Customers are responsible for ensuring the NAT IP pool advertised to Microsoft is not advertised to the Internet when utilizing the Azure ExpressRoute service.
- Customers are responsible for adhering to peering requirements with other Microsoft Online Services such as Office 365 when utilizing the Azure ExpressRoute service.
- Customers utilizing the Azure ExpressRoute service are responsible for encrypting their data while in transit.
- Customers utilizing the Azure ExpressRoute service are responsible for protection of their Cloud Services and resource groups through use of appropriate security and firewalling.
- Customers are responsible for implementing appropriate authentication mechanisms and only granting admin access to appropriate individuals to maintain the integrity of their AAD tenant.
- Customers utilizing AAD services are responsible for implementing appropriate authentication mechanisms and limiting admin access to appropriate individuals to maintain integrity of their SaaS applications.
- Customers are responsible to implement logical access controls to provide reasonable assurance that unauthorized access to key systems will be restricted.
- Customers are responsible for backing up keys that they add to Azure Key Vault.
- Customers are responsible for physically securing the StorSimple device in their premise.
- Customers are responsible for specifying strong cloud encryption key used for encrypting the data from their StorSimple device to the cloud.
- Customers are responsible for providing Internet connectivity for their StorSimple device to communicate with Azure.
- Customers are responsible for appropriately testing application systems deployed in the Dynamics 365 environment prior to deployment in the production environment.
- Customers are responsible for appropriately testing and approving customer developed customizations and extensions prior to deployment in the Dynamics 365 production environment.
- Customers are responsible for understanding and adhering to the contents of their service contracts, including commitments related to system security, availability, processing integrity, and confidentiality.
- Customers are responsible for managing their inputs and data uploads to Dynamics 365 for completeness, accuracy, and timeliness to meet commitments related to system security, availability, processing integrity, and confidentiality.
- Customers are responsible for notifying Microsoft of any unauthorized use of Dynamics 365 accounts.
- Customers are responsible for the authorization of transactions processed in the Dynamics 365 system.
- Customers are responsible for validating the completeness and accuracy of customized reporting in the Dynamics 365 environment.
- Customers are responsible for hardening virtual machine images as per their requirements.